

#3

ACTION 254 215072



# EIC 1700 SEARCH REQUEST

Today's Date 10-7-08

Name <u>Sin J. Lee</u>	Priority App. Filing Date <u>Pre Act. Bld</u>
AU/Org. <u>1795</u> Examiner # <u>76060</u>	Case/App. # <u>10/589,382</u>
Bld.&Rm.# <u>Hofellway</u> Phone <u>2-1333</u>	Format for Search Results EMAIL <input checked="" type="checkbox"/> PAPER <input type="checkbox"/>

If this is a Board of Appeals case, check here ☐

Synonyms

Describe this invention in your own words.

SCIENTIFIC REFERENCE BY:  
Sci 2 Tech Int. Cmp

OCT 15 2008

Pat. &amp; TM Offs

Terms to avoid

**Additional Comments**

Plz. search for a fullerene derivative of  
formula (2) in cl. #1

Please submit completed form to your EIC. SPE Signature here indicates Rush

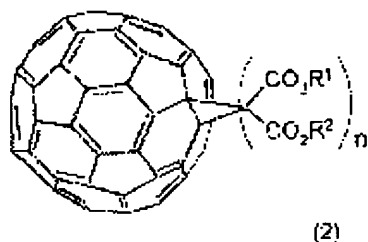
Application No.: 10/589,382  
 Amendment and Response dated July 3, 2005  
 Reply to Office Action of April 3, 2008  
 Docket No.: 1698-6 PCT/US  
 Page 2

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A photoresist composition, comprising:  
 a fullerene derivative (A) having two or more malonic ester residues,  
 a radiation sensitive acid generator (B); and  
 an organic solvent;  
 wherein said fullerene derivative (A) is a compound, expressed by the general formula (2) below:



in which  $n$  is an integer of 2 or more, and  $R^1$  and  $R^2$  independently represent an alkyl group, which may be identical or different from each other.

2. (Original) The photoresist composition according to Claim 1, wherein the malonic ester residue is the group expressed by the general formula (1) below:

=> fil hcap

FILE 'HCAPLUS' ENTERED AT 14:52:34 ON 24 OCT 2008  
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FILE COVERS 1907 - 24 Oct 2008 VOL 149 ISS 18  
FILE LAST UPDATED: 23 Oct 2008 (20081023/ED)

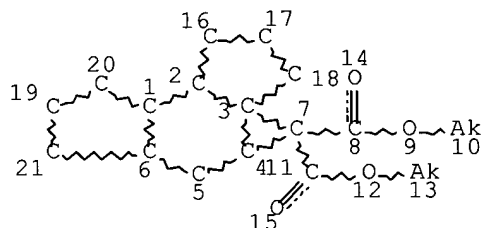
HCAplus now includes complete International Patent Classification (IPC) reclassification data for the second quarter of 2008.

New CAS Information Use Policies, enter HELP USAGETERMS for details.

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que 143

L1 STR



#### NODE ATTRIBUTES:

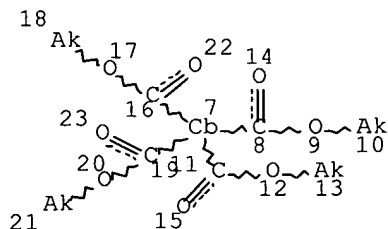
CONNECT IS E1 RC AT 10  
CONNECT IS E1 RC AT 13  
DEFAULT MLEVEL IS ATOM  
GGCAT IS SAT AT 10  
GGCAT IS SAT AT 13  
DEFAULT ECLEVEL IS LIMITED

#### GRAPH ATTRIBUTES:

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NUMBER OF NODES IS 21

#### STEREO ATTRIBUTES: NONE

L5 STR



## NODE ATTRIBUTES:

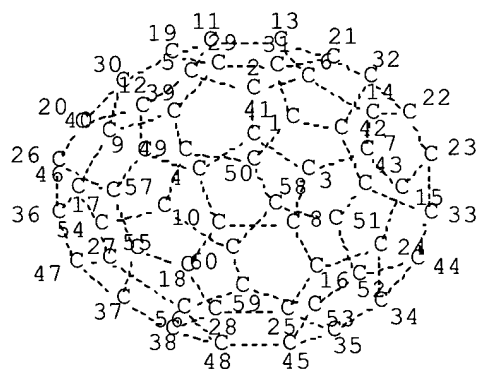
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 GGCAT IS SAT AT 13  
 GGCAT IS SAT AT 18  
 GGCAT IS SAT AT 21  
 DEFAULT ECLEVEL IS LIMITED  
 ECOUNT IS M50 C AT 7

## GRAPH ATTRIBUTES:

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 NUMBER OF NODES IS 17

## STEREO ATTRIBUTES: NONE

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 L8 129 SEA FILE=CAPLUS ABB=ON PLU=ON L7  
 L13 STR



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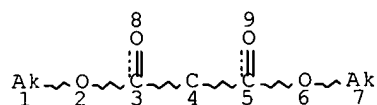
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 DEFAULT ECLEVEL IS LIMITED

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 NUMBER OF NODES IS 60

## STEREO ATTRIBUTES: NONE

L15 STR



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 CONNECT IS E1 RC AT 1  
 CONNECT IS E1 RC AT 7  
 DEFAULT MLEVEL IS ATOM  
 GGCAT IS SAT AT 1  
 GGCAT IS SAT AT 7  
 DEFAULT ECLEVEL IS LIMITED

## GRAPH ATTRIBUTES:

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## STEREO ATTRIBUTES: NONE

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 L22 48167 SEA FILE=HCAPLUS ABB=ON PLU=ON PHOTORESISTS+PFT,NT/CT  
 L23 68681 SEA FILE=HCAPLUS ABB=ON PLU=ON L22 OR ?PHOTORESIST?  
 L25 12 SEA FILE=REGISTRY ABB=ON PLU=ON (109-92-2/BI OR 1116-76-3/BI  
 OR 144317-44-2/BI OR 357164-86-4/BI OR 66003-78-9/BI OR  
 722495-59-2/BI OR 72317-19-2/BI OR 862714-07-6/BI OR 862714-08-  
 7/BI OR 862714-09-8/BI OR 862714-10-1/BI OR 862714-11-2/BI)  
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 L28 7 SEA FILE=REGISTRY ABB=ON PLU=ON L25 NOT (L7 OR L17)  
 L29 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND L28  
 L30 9 SEA FILE=HCAPLUS ABB=ON PLU=ON ?MALONIC?(3A)?ESTER? AND L27  
 L31 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L26 OR L29 OR L30  
 L32 1 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND ?RESIST?  
 L33 9 SEA FILE=HCAPLUS ABB=ON PLU=ON L31 OR L32  
 L36 12 SEA FILE=HCAPLUS ABB=ON PLU=ON L27 AND P/DT  
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 L41 105 SEA FILE=HCAPLUS ABB=ON PLU=ON L40 AND PY<2005  
 L42 6 SEA FILE=HCAPLUS ABB=ON PLU=ON L41 AND (?RESIST? OR ?RESIN?  
 OR ?FILM?)  
 L43 25 SEA FILE=HCAPLUS ABB=ON PLU=ON L39 OR L42

=> d l43 ibib abs hitind hitstr tot

L43 ANSWER 1 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2006:375634 HCAPLUS Full-text

DOCUMENT NUMBER: 145:62535

TITLE: Electrophoresis of electrostatically assembled  
 fullerene-porphyrin conjugates

AUTHOR(S): Hartnagel, Uwe; Balbinot, Domenico; Jux, Norbert;  
 Hirsch, Andreas

CORPORATE SOURCE: Institut fuer Organische Chemie, Universitaet  
 Erlangen-Nuernberg, Erlangen, 91054, Germany

SOURCE: Organic & Biomolecular Chemistry (2006), 4(9),  
 1785-1795

CODEN: OBCRAK; ISSN: 1477-0520

PUBLISHER: Royal Society of Chemistry

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 145:62535

AB The formation of electrostatically coupled assemblies of a series of anionic  
 dendritic fullerene derivs. and cationic porphyrins in buffered aqueous media

was studied with gel electrophoresis. Of central interest in these investigations was the variation of the amount of charge carried by the mols., their size, shape and self-aggregation. Ferric cytochrome c and a rigid zinc porphyrin served as octacationic species. The two new dendritic anionic fullerene derivs. were synthesized. The formation of electrostatic complexes of the fullerene polyelectrolytes with the octacationic species was clearly evident in the gel electrophoresis experiment. The electrophoresis expts. confirmed previous results obtained with other techniques on a qual. level and gave new insights into aggregation phenomena.

CC 22-13 (Physical Organic Chemistry)

Section cross-reference(s): 7, 66

IT 112-35-6, Triethylene glycol monomethyl ether 141-82-2, **Malonic acid**, reactions 59854-12-5, tert-Butyl 4-hydroxybutyrate

RL: RCT (Reactant); RACT (Reactant or reagent)

(**esterification**; electrophoresis of electrostatically assembled fullerene-porphyrin conjugates)

IT **890843-37-5**

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(fullerene core of dendritic polyamide, electrostatic complexation; electrophoresis of electrostatically assembled fullerene-porphyrin conjugates)

IT **890843-37-5**

RL: PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process)

(fullerene core of dendritic polyamide, electrostatic complexation; electrophoresis of electrostatically assembled fullerene-porphyrin conjugates)

RN 890843-37-5 HCAPLUS

CN 3'H,3''H,3'''H,3''''H,3'''''H,3''''''H-  
Hexacyclopropa[1,9:16,17:21,40:30,31:44,45:52,60][5,6]fullerene-C60-Ih-  
3',3'',3''',3'''',3''''',3''''''-decacarboxylic acid,  
3''''''',3''''''''-bis[(3-carboxypropyl)amino]carbonyl]-,  
3',3'',3''',3'''',3''''',3''''''-decadodecyl ester (9CI)  
(CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

REFERENCE COUNT: 46 THERE ARE 46 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 2 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:1045078 HCAPLUS Full-text

DOCUMENT NUMBER: 143:346938

TITLE: Methanofullerene compounds, and process for the preparation thereof

INVENTOR(S): Niimi, Takaaki; Maeda, Tomoko; Toda, Atsushi

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan; Frontier Carbon Corporation

SOURCE: Jpn. Kokai Tokkyo Koho, 31 pp.

CODEN: JKXXAF

DOCUMENT TYPE: **Patent**

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2005263795	A	20050929	JP 2005-41674	20050218
PRIORITY APPLN. INFO.:			JP 2004-42532	A 20040219
OTHER SOURCE(S):		MARPAT 143:346938		

Diagram of a single neuron. An oval labeled "FLN" is connected to a bracketed box containing "R1" and "R2". The box is followed by a subscript "n" and a vertical bar "|", indicating a vector of responses.

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 3 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2005:962524 HCAPLUS Full-text  
 DOCUMENT NUMBER: 143:238698  
 TITLE: **Photoresist** composition and method of forming  
**resist** pattern  
 INVENTOR(S): Ogata, Toshiyuki; Hojo, Takuma; Tsuji, Hiromitsu;  
 Hirotsaki, Takako; Sato, Mitsuru  
 PATENT ASSIGNEE(S): Tokyo Ohka Kogyo Co., Ltd., Japan  
 SOURCE: PCT Int. Appl., 40 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: **Patent**  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005081061	A1	20050901	WO 2005-JP1392	20050201
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
JP 2005266798	A	20050929	JP 2005-41438	20050218
US 20070190447	A1	20070816	US 2006-589382	20060815
KR 2007018033	A	20070213	KR 2006-718377	20060908
KR 825465	B1	20080428		
PRIORITY APPLN. INFO.:			JP 2004-43692	A 20040219
			WO 2005-JP1392	W 20050201

OTHER SOURCE(S): MARPAT 143:238698  
 AB Title **photoresist** composition contains a fullerene derivative having two or more **malonic ester** residues for improved etching **resistance**.  
 IC ICM G03F007-004  
 ICS G03F007-038; G03F007-039  
 CC 74-5 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)  
 ST **photoresist** fullerene **malonic ester** deriv  
 IT **Photoresists**  
 (photoresist composition containing fullerene **malonic ester** derivs.)  
 IT 862714-07-6P 862714-08-7P 862714-09-8P  
 862714-10-1P 862714-11-2P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (photoresist composition containing fullerene **malonic ester** derivs.)  
 IT 109-92-2D, Ethyl vinyl ether, reaction products with hydroxy-containing polymers 72317-19-2, Hydroxystyrene-styrene copolymer 722495-59-2D, reaction products with Et vinyl ether  
 RL: POF (Polymer in formulation); TEM (Technical or engineered material use); USES (Uses)  
 (photoresist composition containing fullerene **malonic ester** derivs.)  
 IT 1116-76-3, Tri-n-octylamine 66003-78-9,

*Pres. Invention*

Triphenylsulfonium trifluoromethanesulfonate 144317-44-2,  
 Triphenylsulfonium nonafluorobutanesulfonate 357164-86-4  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (photoresist composition containing fullerene malonic  
 ester derivs.)

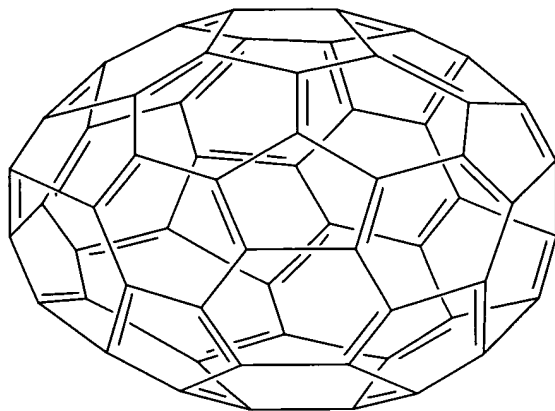
IT 862714-07-6P 862714-08-7P 862714-09-8P  
 862714-10-1P 862714-11-2P

RL: IMF (Industrial manufacture); TEM (Technical or engineered material  
 use); PREP (Preparation); USES (Uses)  
 (photoresist composition containing fullerene malonic  
 ester derivs.)

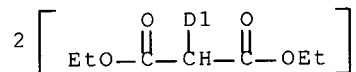
RN 862714-07-6 HCAPLUS

CN [5,6]Fullerene-C60-Ih-diacetic acid,  
 $\alpha,\alpha'$ -bis(ethoxycarbonyl)-, diethyl ester (9CI) (CA INDEX  
 NAME)

PAGE 1-A



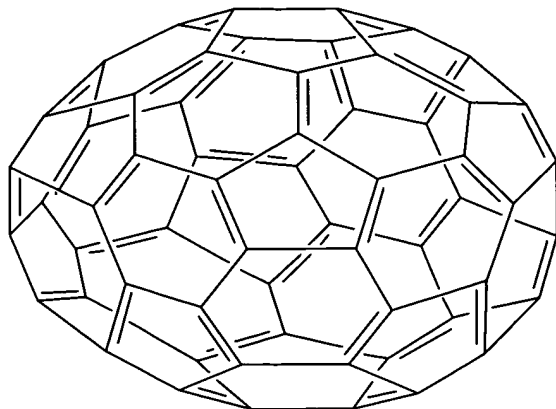
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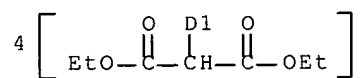
RN 862714-08-7 HCAPLUS

CN [5,6]Fullerene-C60-Ih-tetraacetic acid,  
 $\alpha,\alpha',\alpha'',\alpha'''$ -tetrakis(ethoxycarbonyl)-,  
 tetraethyl ester (9CI) (CA INDEX NAME)

PAGE 1-A

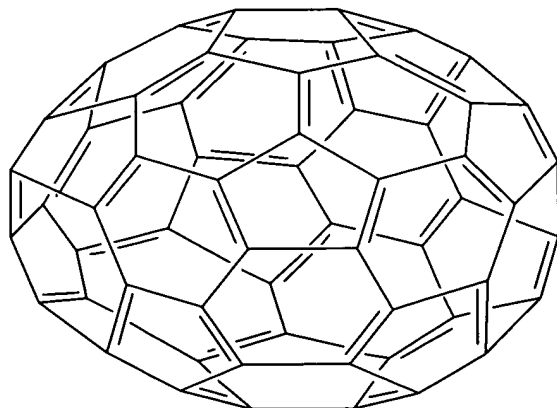


PAGE 2-A

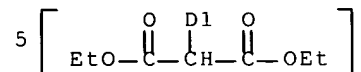


RN 862714-09-8 HCAPLUS  
 CN [5,6]Fullerene-C60-Ih-pentaacetic acid,  
 $\alpha, \alpha', \alpha'', \alpha''', \alpha''''$ -pentakis(ethoxycarbonyl)-  
 , pentaethyl ester (9CI) (CA INDEX NAME)

PAGE 1-A

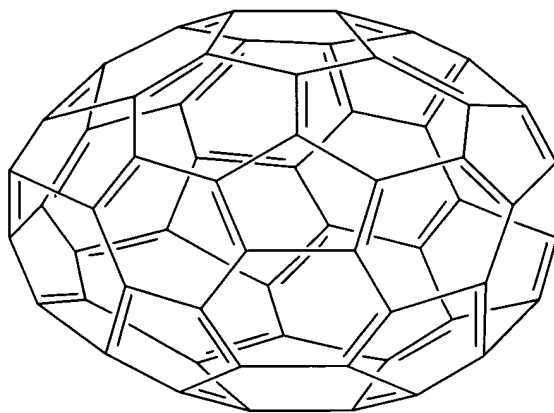


PAGE 2-A

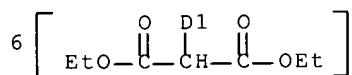


RN 862714-10-1 HCAPLUS  
 CN [5,6]Fullerene-C60-Ih-hexaacetic acid,  
 $\alpha, \alpha', \alpha'', \alpha''', \alpha'''', \alpha'''''$ -  
 hexakis(ethoxycarbonyl)-, hexaethyl ester (9CI) (CA INDEX NAME)

PAGE 1-A

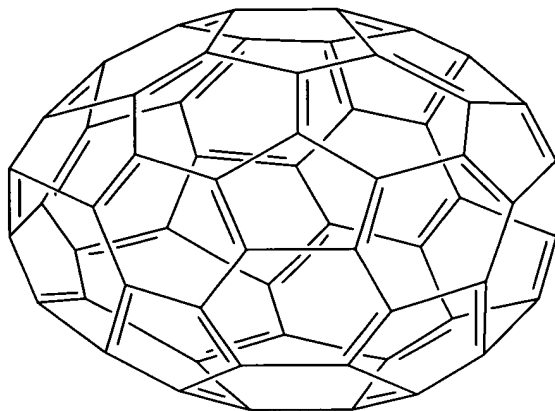


PAGE 2-A

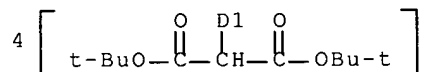


RN 862714-11-2 HCAPLUS  
 CN [5,6]Fullerene-C60-Ih-tetraacetic acid,  
 $\alpha, \alpha', \alpha'', \alpha'''$ -tetrakis[(1,1-  
 dimethylethoxy)carbonyl]-, tetrakis(1,1-dimethylethyl) ester (9CI) (CA  
 INDEX NAME)

PAGE 1-A



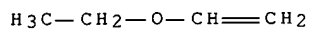
PAGE 2-A



IT 109-92-2D, Ethyl vinyl ether, reaction products with  
hydroxy-containing polymers 72317-19-2, Hydroxystyrene-styrene  
copolymer 722495-59-2D, reaction products with Et vinyl ether  
RL: POF (Polymer in formulation); TEM (Technical or engineered material  
use); USES (Uses)  
(photoresist composition containing fullerene malonic  
ester derivs.)

RN 109-92-2 HCAPLUS

CN Ethene, ethoxy- (CA INDEX NAME)



RN 72317-19-2 HCAPLUS

CN Phenol, ethenyl-, polymer with ethenylbenzene (CA INDEX NAME)

CM 1

CRN 31257-96-2

CMF C8 H8 O

CCI IDS



D1— OH

D1— CH=CH<sub>2</sub>

CM 2

CRN 100-42-5

CMF C8 H8

H<sub>2</sub>C=CH— Ph

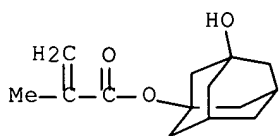
RN 722495-59-2 HCAPLUS

CN 2-Propenoic acid, 2-methyl-, 3-hydroxytricyclo[3.3.1.1<sup>3,7</sup>]dec-1-yl ester,  
polymer with 4-ethenylphenol (CA INDEX NAME)

CM 1

CRN 115372-36-6

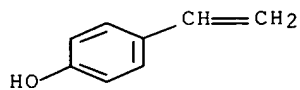
CMF C14 H20 O3



CM 2

CRN 2628-17-3

CMF C8 H8 O

IT 1116-76-3, Tri-n-octylamine 66003-78-9,  
Triphenylsulfonium trifluoromethanesulfonate 144317-44-2,

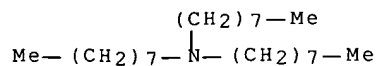
Triphenylsulfonium nonafluorobutanesulfonate **357164-86-4**

RL: TEM (Technical or engineered material use); USES (Uses)

(photoresist composition containing fullerene malonic ester derivs.)

RN 1116-76-3 HCAPLUS

CN 1-Octanamine, N,N-dioctyl- (CA INDEX NAME)



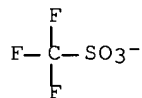
RN 66003-78-9 HCAPLUS

CN Sulfonium, triphenyl-, 1,1,1-trifluoromethanesulfonate (1:1) (CA INDEX NAME)

CM 1

CRN 37181-39-8

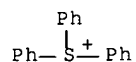
CMF C F3 O3 S



CM 2

CRN 18393-55-0

CMF C18 H15 S



RN 144317-44-2 HCAPLUS

CN Sulfonium, triphenyl-, 1,1,2,2,3,3,4,4,4-nonafluoro-1-butanesulfonate (1:1) (CA INDEX NAME)

CM 1

CRN 45187-15-3

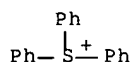
CMF C4 F9 O3 S



CM 2

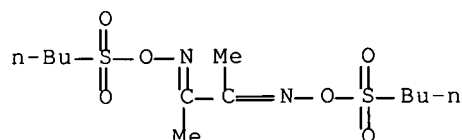
CRN 18393-55-0

CMF C18 H15 S



RN 357164-86-4 HCAPLUS

CN 2,3-Butanedione, 2,3-dibutylsulfonyloxime (CA INDEX NAME)



REFERENCE COUNT: 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 4 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:587245 HCAPLUS Full-text

DOCUMENT NUMBER: 143:97178

TITLE: Preparation of fullerene-carboxylic acid adducts and  
materials comprising them

INVENTOR(S): Toda, Atsushi; Maeda, Tomoko; Kawakami, Kiminori

PATENT ASSIGNEE(S): Mitsubishi Chemical Corp., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 17 pp.

CODEN: JKXXAF

DOCUMENT TYPE: **Patent**

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
JP 2005179344	A	20050707	JP 2004-337439	20041122
PRIORITY APPLN. INFO.:			JP 2003-393759	A 20031125

AB Title compds. are prepared by hydrolysis of fullerene-carboxylate ester  
adducts. The materials show cation content (other than proton)  $\leq 5$  weight ppm  
in dry states. C60 fullerene-diethyl malonate adduct was hydrolyzed in the  
presence of LiOH at 40-50° for 2 h to give 90% C60 fullerene-malonic acid  
adduct.

IC ICM C07C051-09

ICS C07C061-29

CC 25-29 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)

IT **160768-45-6**

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of fullerene-carboxylic acid addition products by hydrolysis)

of

their esters)

IT 160768-45-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(preparation of fullerene-carboxylic acid addition products by hydrolysis

of

their esters)

RN 160768-45-6 HCAPLUS

CN 3'H,3''H,3'''H,3''''H,3'''''H,3''''''H-

Hexacyclopropa[1,9:16,17:21,40:30,31:44,45:52,60][5,6]fullerene-C60-Ih-

3',3'',3''',3''''',3''''''',3'''''''',3''''''''',3'''''''''',3''''''''''',3'''''''''''-

dodecacarboxylic acid, 3',3'',3''',3''''',3''''''',3'''''''',3''''''''',3'''''''''',3''''''''''',3'''''''''''',3

''''''',3''''''''-dodecaethyl ester (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 5 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2005:371169 HCAPLUS Full-text

DOCUMENT NUMBER: 142:430029

TITLE: Amphiphilic [5:1]- and [3:3]-hexakis-adducts of  
fullerenes based on malonate groups, and their  
preparation and use in the formation of micelles and  
the treatment of oxidative stress diseases

INVENTOR(S): Hirsch, Andreas

PATENT ASSIGNEE(S): C Sixty Inc., USA

SOURCE: PCT Int. Appl., 79 pp.

CODEN: PIXXD2

DOCUMENT TYPE: **Patent**

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2005037711	A1	20050428	WO 2004-US34003	20041014
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
US 20050143327	A1	20050630	US 2004-963990	20041013
CA 2540195	A1	20050428	CA 2004-2540195	20041014
PRIORITY APPLN. INFO.:			US 2003-511763P	P 20031015
			WO 2004-US34003	W 20041014

OTHER SOURCE(S): CASREACT 142:430029

AB Malonate-substituted fullerenes are disclosed, comprising a fullerene core (C<sub>n</sub>, wherein n is an even integer greater than or equal to 60), plus 3 or 5 dihydrocarbylmalonate groups [i.e., C(COOR<sub>1</sub>)(COOR<sub>2</sub>) where R<sub>1</sub> and R<sub>2</sub> are hydrocarbyl] bonded to the fullerene core, and 1 or 3 polar extended malonate groups [i.e., C(COOR<sub>3</sub>)(COOR<sub>4</sub>), where R<sub>3</sub> and R<sub>4</sub> contain terminal polar moieties], also bonded to the fullerene core. Terminal polar moieties include biotin, NH<sub>2</sub>, CO<sub>2</sub>H, CONH<sub>2</sub>, and their protonated forms. The substituted fullerenes can form micelles, and (no data) can be used to ameliorate oxidative stress diseases. Approx. 10 invention compds. and approx. 20

fullerene intermediates were prepared in examples. For instance, DMA-templated tris-cyclopropanation of the e,e,e-tris-adduct of cyclo-[3]-octyl malonate with C60, using the malonate diester CH<sub>2</sub>[COO(CH<sub>2</sub>)<sub>14</sub>CONH(CH<sub>2</sub>)<sub>3</sub>(OCH<sub>2</sub>CH<sub>2</sub>)<sub>20</sub>(CH<sub>2</sub>)<sub>3</sub>NH-Boc]<sub>2</sub> (preparation given), CBr<sub>4</sub>, and DBU in PhMe, gave the expected hexakis-adduct in 55% yield. Deprotection of the latter with TFA in CH<sub>2</sub>Cl<sub>2</sub> (almost quant.) gave a hexaamino amphiphile [a fullerene hexakis(malonate ester) with 3 malonate groups cyclized by 3 (CH<sub>2</sub>)<sub>8</sub> linkages and the other 3 malonates esterified with 6 (CH<sub>2</sub>)<sub>14</sub>CONH(CH<sub>2</sub>)<sub>30</sub>(CH<sub>2</sub>CH<sub>2</sub>O)<sub>2</sub>(CH<sub>2</sub>)<sub>3</sub>NH<sub>2</sub> groups]. The pH-dependent water solubility of I was demonstrated by UV/Vis spectroscopy. I showed very low water solubility at neutral or weakly acidic pH, increased solubility at pH 5, and complete protonation and solubility at pH 3. I formed thin aggregates in basic solution at pH 9-10, with the self-assemblies showing diams. of about 70 Å and great length, similar to carbon nanotubes. At neutral and acidic pH, no aggregates of I were observed. Another prepared hexa-L-alanine amphifullerene was very soluble in THF, DMSO, and water at pH 7.2, and completely insol. in organic solvents such as CH<sub>2</sub>Cl<sub>2</sub> and CHCl<sub>3</sub>.

IC ICM C01B031-02

ICS A61K047-48; A61P039-06; A61P025-28

CC 25-29 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)

Section cross-reference(s): 1, 34, 46, 63, 66

IT 726205-81-8P 726205-83-0P 726205-85-2P 726205-88-5P 727409-10-1P

727409-33-8P 727410-95-9P 727411-82-7P **727411-89-4P**

727411-90-7P 727411-93-0P

RL: PAC (Pharmacological activity); PRP (Properties); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

(amphiphile and drug candidate; preparation of amphiphilic malonate hexakis-adducts of fullerenes and their use in the formation of micelles and the treatment of oxidative stress diseases)

IT 4617-33-8P, 15-Hydroxypentadecanoic acid 194920-62-2P 726205-70-5P

726205-71-6P 726205-72-7P **726205-73-8P 726205-74-9P**

726205-75-0P 726205-76-1P 726205-77-2P 726205-78-3P 726205-79-4P

726205-91-0P 726205-92-1P 726205-93-2P 726205-94-3P 726205-98-7P

727409-24-7P 727409-29-2P 727409-38-3P 727410-94-8P 727411-91-8P

727411-92-9P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(intermediate; preparation of amphiphilic malonate hexakis-adducts of fullerenes and their use in the formation of micelles and the treatment of oxidative stress diseases)

IT 58-85-5, D-(+)-Biotin 106-02-5, Pentadecanolide 141-82-2, Malonic

acid, reactions 929-59-9, O,O'-Bis(2-aminoethyl)ethylene glycol

2488-26-8, L-Alanyl-L-alanine tert-butyl ester 4246-51-9 13404-22-3,

L-Alanine tert-butyl ester hydrochloride 51857-17-1 75937-12-1

99685-96-8, [5,6]Fullerene-C<sub>60</sub>-Ih 103338-25-6, L-Alanyl-L-phenylalanine

tert-butyl ester 153086-78-3 **160768-44-5** 244189-35-3

474781-23-2 726205-97-6

RL: RCT (Reactant); RACT (Reactant or reagent)

(starting material; preparation of amphiphilic malonate hexakis-adducts of fullerenes and their use in the formation of micelles and the treatment of oxidative stress diseases)

IT **727411-89-4P**

RL: PAC (Pharmacological activity); PRP (Properties); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)

(amphiphile and drug candidate; preparation of amphiphilic malonate hexakis-adducts of fullerenes and their use in the formation of micelles and the treatment of oxidative stress diseases)

RN 727411-89-4 HCAPLUS

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(intermediate; preparation of amphiphilic malonate hexakis-adducts of fullerenes and their use in the formation of micelles and the treatment of oxidative stress diseases)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; preparation of amphiphilic malonate hexakis-adducts of  
fullerenes and their use in the formation of micelles and the treatment  
of oxidative stress diseases)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2004313910	A	20041111	JP 2003-110402	20030415

PRIORITY APPLN. INFO.: JP 2003-110402 20030415

AB The title sheet is made of fullerenes supported by a polymer fiber sheet. Colloidal silica, colloidal alumina, or water glass is used as binder. Carrier is selected from zeolite, active C, active alumina, or zirconium phosphate. Fullerenes can be C<sub>n</sub> (where n is 60, 70, 72, 76, or 84), C<sub>p</sub>M<sub>q</sub> (p 60 or 70, M is -OH, -COOH, -SO<sub>3</sub>H, -OSO<sub>3</sub>H, or -O-PO(OH)<sub>2</sub>), or C<sub>60</sub>+r[(COOR)<sub>2</sub>]<sub>r</sub> (where P is H or alkyl group, r 1-12). The fullerenes content is 10 mg/m<sup>2</sup> to 5 g/m<sup>2</sup>.

IC ICM B01D039-14  
ICS A61L009-00; A61L009-18

CC 47-2 (Apparatus and Plant Equipment)  
Section cross-reference(s): 9, 59

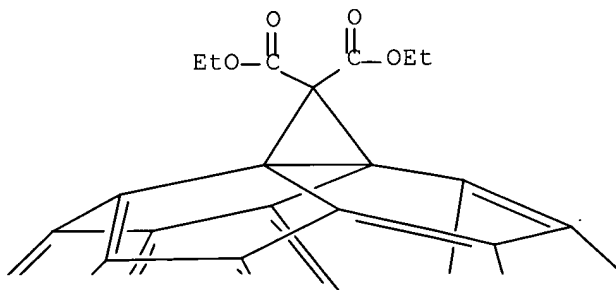
IT 1344-09-8, Water glass 7631-86-9, Colloidal silica, uses 13765-95-2, Zirconium phosphate 99685-96-8, Fullerene C60 115383-22-7, Fullerene C70 155382-70-0  
RL: TEM (Technical or engineered material use); USES (Uses)  
(sterilization filter sheet for air purification)

IT 155382-70-0  
RL: TEM (Technical or engineered material use); USES (Uses)  
(sterilization filter sheet for air purification)

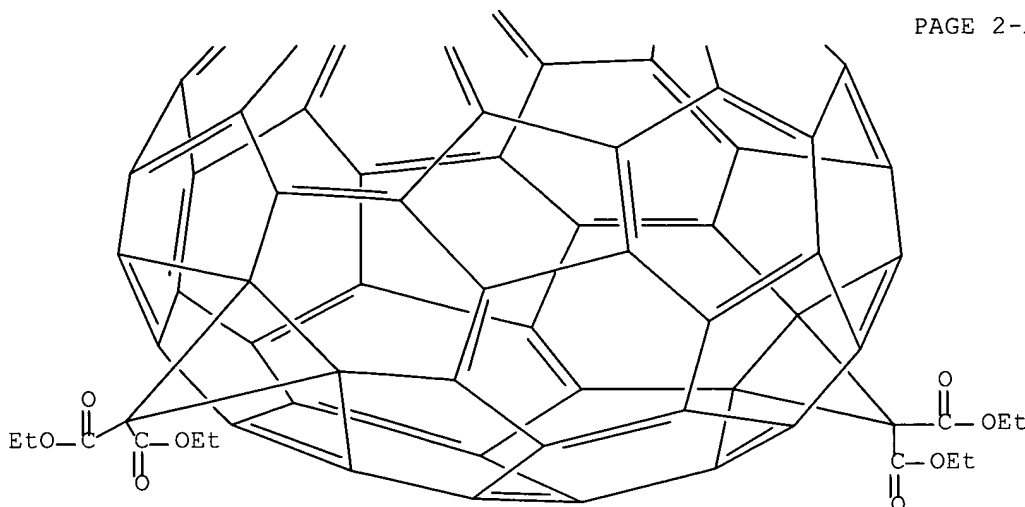
RN 155382-70-0 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:34,35:43,57][5,6]fullerene-C60-Ih-3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



L43. ANSWER 7 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2004:695143 HCAPLUS Full-text  
 DOCUMENT NUMBER: 142:123620  
 TITLE: High-resolution synchrotron data collection for  
 charge-density work at 100 and 20 K  
 AUTHOR(S): Luger, Peter; Messerschmidt, Marc; Scheins, Stephan;  
 Wagner, Armin  
 CORPORATE SOURCE: Institute for Chemistry/Crystallography, Free  
 University Berlin, Berlin, D-14195, Germany  
 SOURCE: Acta Crystallographica, Section A: Foundations of  
 Crystallography (2004), A60(5), 390-396  
 CODEN: ACACEQ; ISSN: 0108-7673  
 PUBLISHER: Blackwell Publishing Ltd.  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB For the measurement of very accurate high-resolution x-ray data for charge-d.  
 work, synchrotron beamlines provide a bright radiation source of outstanding  
 properties. Most important are the very high primary intensity and the  
 possibility of choosing hard radiation with  $\lambda \approx 0.5 \text{ \AA}$  or even shorter. This  
 together with area detection and a stable low-temperature device means that  
 accurate and large data sets can be measured in a short time. A number of  
 data collections are reported, which were carried out at the beamlines F1 and  
 D3 of Hasylab (DESY, Hamburg) 1st at 100 K and later at 15-20 K, demonstrating  
 the quality of the measured intensities. A low temperature of .apprx.20 K was  
 obtained at beamline D3 with a double-stage closed-cycle He cryostat where the  
 standard Be cylinder of the vacuum chamber was replaced by a 0.1 mm Kapton  
**film**. Comparison of different data sets measured for a strychnine crystal  
 demonstrated how  $I/\sigma$  ratios favorably improve if synchrotron radiation at a  
 low temperature of 15 K was used. Synchrotron-based studies on several biol.  
 active compds. are briefly summarized and a synchrotron experiment of an  
 otherwise not sufficiently diffracting crystal of a tetraphenylbarbaralane  
 derivative is described. Atomic vols. and charges of a highly substituted C60  
 fullerene are reported derived from a synchrotron data set of >350000  
 reflections.

CC 75-8 (Crystallography and Liquid Crystals)

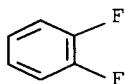
Section cross-reference(s): 9, 22

IT 57-24-9, Strychnine 150251-95-9 447405-26-7

RL: PRP (Properties)  
(high-resolution synchrotron data collection for charge-d. work at 100 and  
20 K)  
IT 447405-26-7  
RL: PRP (Properties)  
(high-resolution synchrotron data collection for charge-d. work at 100 and  
20 K)  
RN 447405-26-7 HCAPLUS  
CN 3'H,3''H,3'''H,3''''H,3'''''H,3''''''H-  
Hexacyclopropa[1,9:16,17:21,40:30,31:44,45:52,60][5,6]fullerene-C60-Ih-  
3',3'',3''',3'''',3''''',3''''',3''''',3''''',3''''',3''''',3''''',3'''''-  
dodecacarboxylic acid, dodecaethyl ester, compd. with 1,2-difluorobenzene  
(1:2) (9CI) (CA INDEX NAME)  
  
CM 1  
  
CRN 160768-45-6  
CMF C102 H60 O24

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

CM 2  
  
CRN 367-11-3  
CMF C6 H4 F2



REFERENCE COUNT: 31 THERE ARE 31 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 8 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 2004:142814 HCAPLUS Full-text  
DOCUMENT NUMBER: 140:199113  
TITLE: Preparation of therapeutic malonic acid/acetic acid  
buckminsterfullerenes as neuroprotective antioxidants  
INVENTOR(S): Dugan, Laura L.; Lovett, Eva G.; Quick, Kevin L.;  
Hardt, Joshua I.  
PATENT ASSIGNEE(S): USA  
SOURCE: U.S. Pat. Appl. Publ., 30 pp., Cont.-in-part of U.S.  
Ser. No. 83,283.  
CODEN: USXXCO  
DOCUMENT TYPE: **Patent**  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 2  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
US 20040034100	A1	20040219	US 2003-373425	20030224
US 7145032	B2	20061205		
US 20030162837	A1	20030828	US 2002-83283	20020223
CA 2517007	A1	20040910	CA 2004-2517007	20040224
WO 2004076349	A1	20040910	WO 2004-US5442	20040224

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI

RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

EP 1597199 A1 20051123 EP 2004-714163 20040224

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK

JP 2006518760 T 20060817 JP 2006-503837 20040224

US 20070106087 A1 20070510 US 2006-424175 20060614

US 20080214670 A1 20080904 US 2008-44634 20080307

PRIORITY APPLN. INFO.: US 2002-83283 A2 20020223

US 2003-373425 A 20030224

WO 2004-US5442 W 20040224

US 2006-424175 A3 20060614

OTHER SOURCE(S): CASREACT 140:199113; MARPAT 140:199113

AB Title compds. with general formula C6OR3 [I, wherein R = independently CR1R2; R1, R2 = independently H, CO2H, CO2Me; and pharmaceutically acceptable salts, esters or carriers thereof] were prepared as neuroprotective antioxidants. For example, reaction of C60 and di-Me bromomalonate in toluene, followed by hydrolysis with sodium methoxide, gave I (R1 = R2 = CO2H) in 89% yield. Administration of the latter to mice increased their lifespans by approx. 20% compared to controls, and I also showed neuroprotection vs. NMDA and AMPA toxicity. Thus, title compds. and their pharmaceutical compns. are useful for treating neuronal injury and for life-extension.

IC ICM A61K031-192

ICS C07C063-48

INCL 514569000; 562488000

CC 25-29 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)

Section cross-reference(s): 1, 63

IT 583027-50-3P 660836-40-8P 660836-42-0P

660836-45-3P 660836-49-7P 660836-53-3P 660836-56-6P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of therapeutic malonic acid/acetic acid buckminsterfullerenes as neuroprotective antioxidants)

IT 583027-50-3P 660836-40-8P 660836-42-0P

660836-45-3P 660836-53-3P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(preparation of therapeutic malonic acid/acetic acid buckminsterfullerenes as neuroprotective antioxidants)

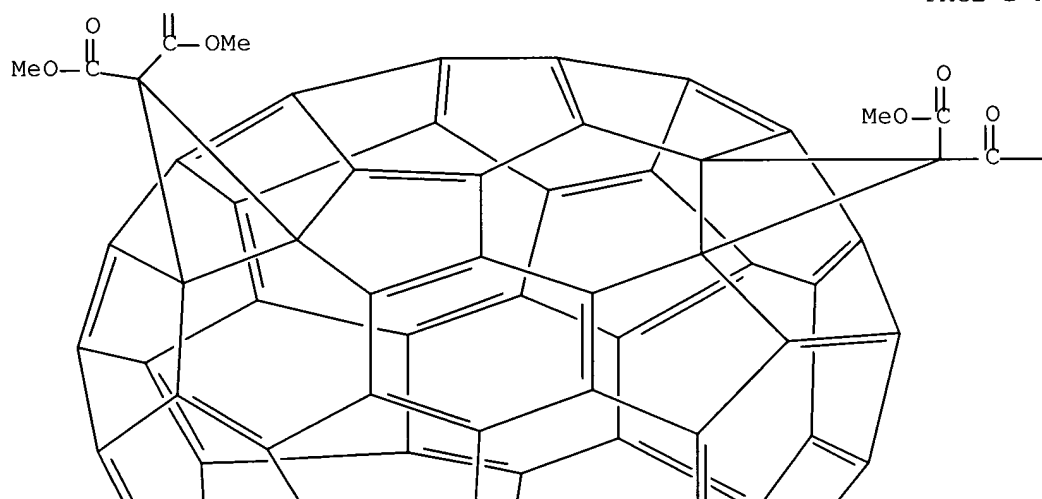
RN 583027-50-3 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexamethyl ester (9CI) (CA INDEX NAME)

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O

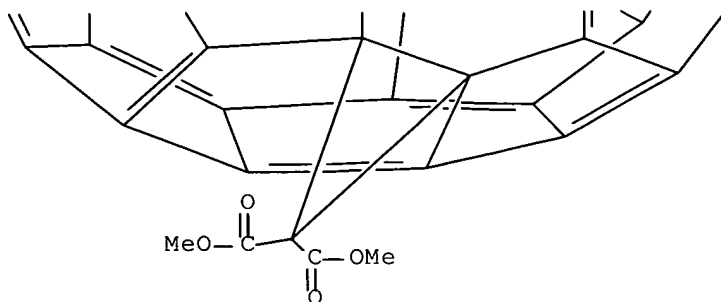
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— OMe

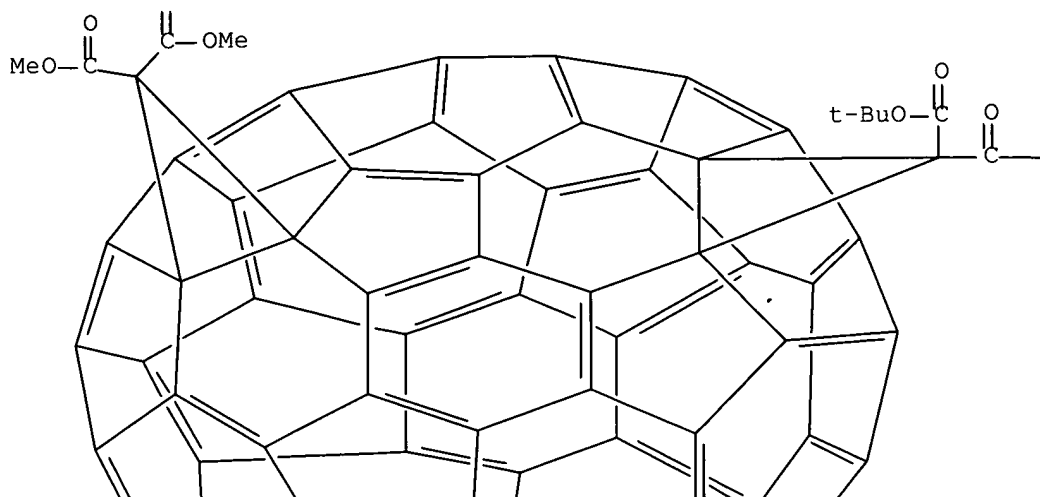
PAGE 3-A



RN 660836-40-8 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid, 3',3'-bis(1,1-dimethylethyl)  
 3'',3'',3''',3'''-tetramethyl ester (9CI) (CA INDEX NAME)

PAGE 1-A

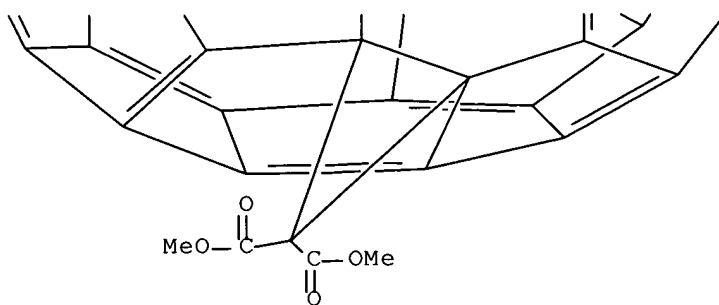
PAGE 2-A



PAGE 2-B

—OBu-t

PAGE 3-A

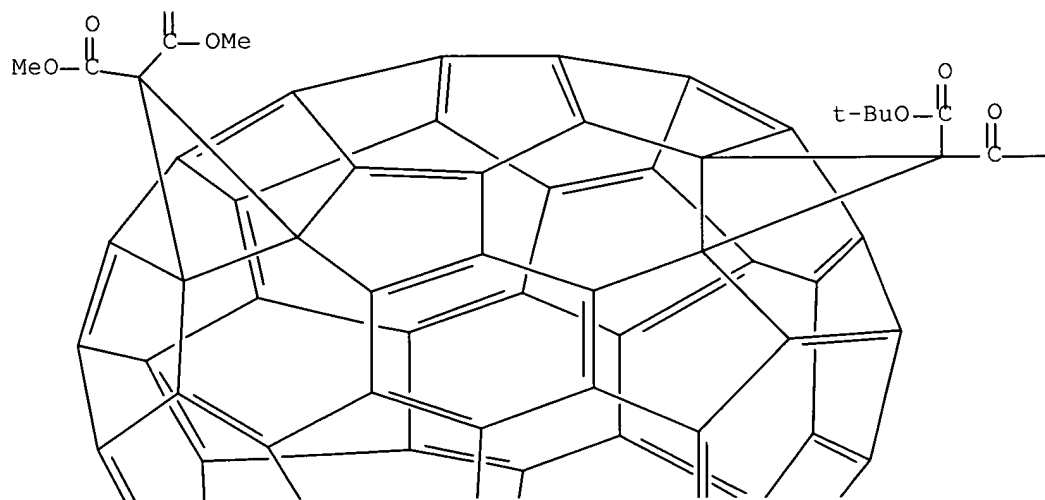


RN 660836-42-0 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-1h-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid,  
 3',3',3'',3''-tetrakis(1,1-dimethylethyl) 3''',3'''-dimethyl ester (9CI)  
 (CA INDEX NAME)

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O

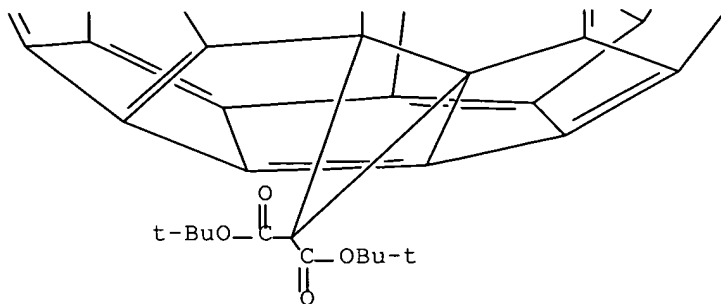
PAGE 2-A



PAGE 2-B

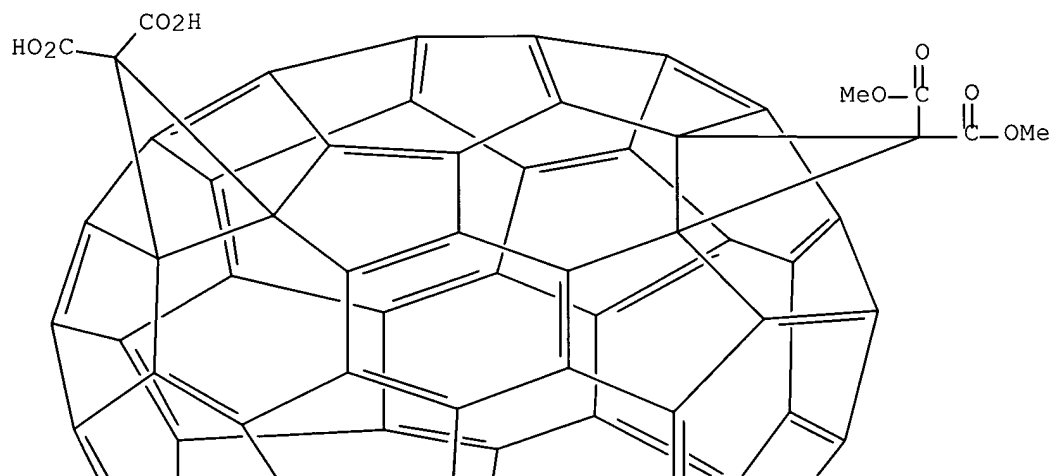
— OBU-t

PAGE 3-A

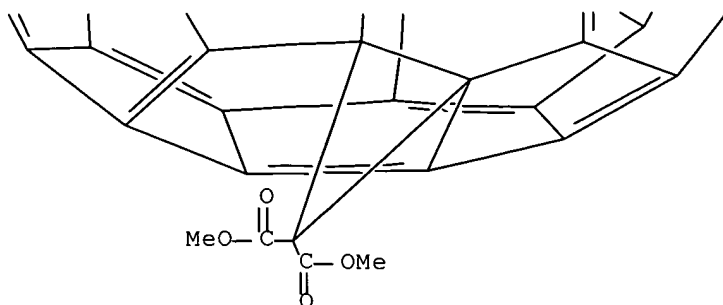


RN 660836-45-3 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclop[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid, 3'',3'',3''',3'''-tetramethyl  
 ester (9CI) (CA INDEX NAME)

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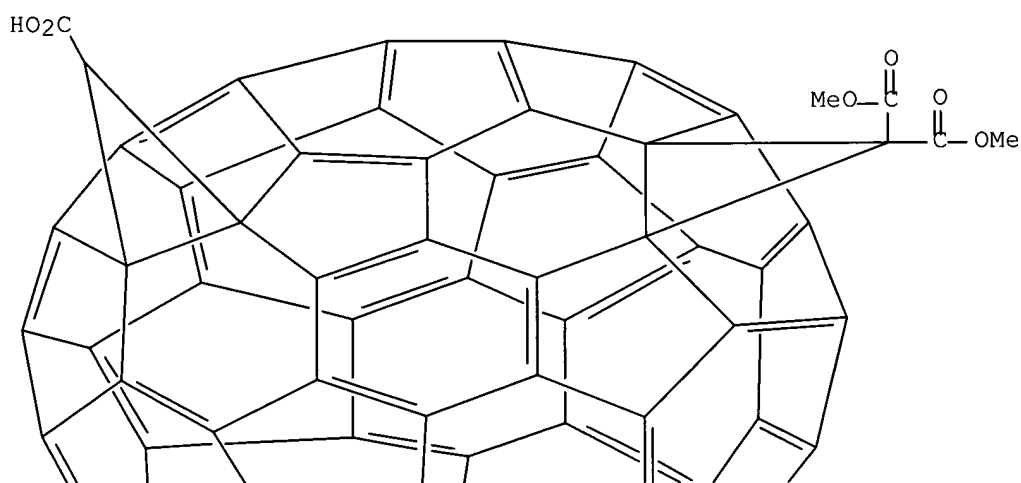


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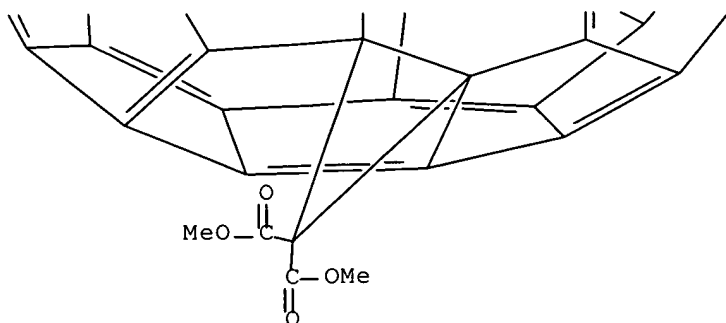


RN 660836-53-3 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3'',3''',3''''-pentacarboxylic acid, 3'',3''',3'''',3'''''-tetramethyl  
 ester (9CI) (CA INDEX NAME)

PAGE 1-A



PAGE 2-A



L43 ANSWER 9 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2003:931014 HCAPLUS Full-text  
 DOCUMENT NUMBER: 139:402992  
 TITLE: Derivatization and solubilization of fullerenes for  
 use in therapeutic and diagnostic applications  
 INVENTOR(S): Bolskar, Robert D.; Alford, J. Michael  
 PATENT ASSIGNEE(S): USA  
 SOURCE: U.S. Pat. Appl. Publ., 25 pp., Cont.-in-part of U.S.  
 Ser. No. 263,375.  
 CODEN: USXXCO  
 DOCUMENT TYPE: **Patent**  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 2  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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US 20030220518	A1	20031127	US 2003-410809	20030409
US 20030065206	A1	20030403	US 2002-263375	20021001
AU 2002334784	A1	20030414	AU 2002-334784	20021001
PRIORITY APPLN. INFO.:			US 2001-326353P	P 20011001
			US 2002-371380P	P 20020409
			US 2002-263375	A2 20021001
			WO 2002-US31362	W 20021001

OTHER SOURCE(S): MARPAT 139:402992

AB The invention provides improved therapeutic and diagnostic fullerenes and endohedral fullerenes. The fullerenes and endohedral fullerenes of the invention are derivatized with at least two charged functional groups (and preferably more than two charged functional groups) to provide for water-solubility and improved in vivo biodistribution. Improved derivatized fullerenes and endohedral fullerenes carry a plurality of functional groups at least two of which are charged. Preferably at least about 1/6 of the possible derivation sites on the fullerene cage carry derivs. and preferably at least about 1/2 of the functional groups on the fullerene cage are charged groups. The invention also provides water-soluble endohedral metallofullerenes with improved biodistribution which are useful as in vivo imaging agents, including MRI contrast agents. Thus, Gd@C60[C(COOH)2]10 was prepared by reacting Gd@C60 with di-Et bromomalonate and converting the ester to the acid. Relaxity measurements and in vivo MRI measurements were made for Gd@C60[C(COOH)2]10.

IC ICM C07C229-00

ICS C07C063-64

INCL 560019000; 562433000; 562405000

CC 78-5 (Inorganic Chemicals and Reactions)

Section cross-reference(s): 8, 25

IT 7429-91-6DP, Dysprosium, functionalized fullerene encapsulated  
 7439-90-9DP, Krypton, functionalized fullerene encapsulated 7439-91-0DP,  
 Lanthanum, functionalized fullerene encapsulated 7439-93-2DP, Lithium,  
 functionalized fullerene encapsulated 7439-94-3DP, Lutetium,  
 functionalized fullerene encapsulated 7439-95-4DP, Magnesium,  
 functionalized fullerene encapsulated 7439-99-8DP, Neptunium,  
 functionalized fullerene encapsulated 7440-00-8DP, Neodymium,  
 functionalized fullerene encapsulated 7440-01-9DP, Neon, functionalized  
 fullerene encapsulated 7440-07-5DP, Plutonium, functionalized fullerene  
 encapsulated 7440-09-7DP, Potassium, functionalized fullerene  
 encapsulated 7440-10-0DP, Praseodymium, functionalized fullerene  
 encapsulated 7440-13-3DP, Protactinium, functionalized fullerene

encapsulated 7440-14-4DP, Radium, functionalized fullerene encapsulated  
 7440-17-7DP, Rubidium, functionalized fullerene encapsulated  
 7440-19-9DP, Samarium, functionalized fullerene encapsulated  
 7440-20-2DP, Scandium, functionalized fullerene encapsulated  
 7440-23-5DP, Sodium, functionalized fullerene encapsulated 7440-24-6DP,  
 Strontium, functionalized fullerene encapsulated 7440-27-9DP, Terbium,  
 functionalized fullerene encapsulated 7440-29-1DP, Thorium,  
 functionalized fullerene encapsulated 7440-30-4DP, Thulium,  
 functionalized fullerene encapsulated 7440-34-8DP, Actinium,  
 functionalized fullerene encapsulated 7440-35-9DP, Americium,  
 functionalized fullerene encapsulated 7440-36-0DP, Antimony,  
 functionalized fullerene encapsulated 7440-37-1DP, Argon, functionalized  
 fullerene encapsulated 7440-39-3DP, Barium, functionalized fullerene  
 encapsulated 7440-41-7DP, Beryllium, functionalized fullerene  
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 7440-46-2DP, Cesium, functionalized fullerene encapsulated 7440-50-8DP,  
 Copper, functionalized fullerene encapsulated 7440-52-0DP, Erbium,  
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 functionalized fullerene encapsulated 7440-63-3DP, Xenon, functionalized  
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 7440-67-7DP, Zirconium, functionalized fullerene encapsulated  
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 7440-69-9DP, Bismuth, functionalized fullerene encapsulated 7440-70-2DP,  
 Calcium, functionalized fullerene encapsulated 7723-14-0DP,  
 Phosphorus-31, functionalized fullerene encapsulated 10043-92-2DP,  
 Radon, functionalized fullerene encapsulated 13967-65-2DP, Holmium-166,  
 functionalized fullerene encapsulated, preparation 13967-74-3DP,  
 Cerium-141, functionalized fullerene encapsulated, preparation  
 13981-14-1DP, Protactinium-233, functionalized fullerene encapsulated,  
 preparation 13981-25-4DP, Copper-64, functionalized fullerene  
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 functionalized fullerene encapsulated, preparation 14362-44-8DP, Iodine  
 atom, functionalized fullerene encapsulated, preparation 14390-96-6DP,  
 Nitrogen-15, functionalized fullerene encapsulated, preparation  
 14391-19-6DP, Terbium-161, functionalized fullerene encapsulated,  
 preparation 14762-55-1DP, Helium-3, functionalized fullerene  
 encapsulated, preparation 14762-74-4DP, Carbon-13, functionalized  
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 functionalized fullerene encapsulated, preparation 14798-13-1DP,  
 Boron-11, functionalized fullerene encapsulated, preparation  
 14859-67-7DP, Radon-222, functionalized fullerene encapsulated,  
 preparation 14913-49-6DP, Bismuth-212, functionalized fullerene  
 encapsulated, preparation 14932-42-4DP, Xenon-133, functionalized  
 fullerene encapsulated, preparation 15092-94-1DP, Lead-212,  
 functionalized fullerene encapsulated, preparation 15128-03-7DP,  
 Copper-61, functionalized fullerene encapsulated, preparation  
 15623-45-7DP, Radium-223, functionalized fullerene encapsulated,

RL: DGN (Diagnostic use); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(preparation of functionalized fullerenes and endohedral fullerenes with improved water solubility for use in therapeutic and diagnostic applications)

RL: DGN (Diagnostic use); SPN (Synthetic preparation); THU (Therapeutic use); BIOL (Biological study); PREP (Preparation); USES (Uses)  
(preparation of functionalized fullerenes and endohedral fullerenes with improved water solubility for use in therapeutic and diagnostic applications)

[illegible]

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

PATENT INFORMATION:

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,

LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,  
 PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY,  
 KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES,  
 FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, SE, SI, SK, TR, BF,  
 BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2003213206 A1 20030909 AU 2003-213206 20030220  
 EP 1476150 A2 20041117 EP 2003-709252 20030220  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, SK  
 JP 2005538935 T 20051222 JP 2003-571482 20030220  
 US 20040034100 A1 20040219 US 2003-373425 20030224  
 US 7145032 B2 20061205  
 US 20070106087 A1 20070510 US 2006-424175 20060614  
 US 20080214670 A1 20080904 US 2008-44634 20080307  
 PRIORITY APPLN. INFO.: US 2002-83283 A 20020223  
 WO 2003-US5332 W 20030220  
 US 2003-373425 A3 20030224  
 US 2006-424175 A3 20060614

AB The invention provides a method for increasing a metazoan's lifespan, comprising administering a carboxylated derivative of a C 60 fullerene. The invention also provides a process for extending a metazoan's lifespan by administering a superoxide dismutase mimetic, as well as a composition comprising a superoxide dismutase mimetic. The invention further provides a pharmaceutical composition comprising carboxyfullerenes having x pairs of adjacent carbon atoms bonded to two carbons of the C 60 sphere wherein the adjacent carbon atom is further bonded to two groups of the general formula -COOH and -R, wherein R is independently selected from the group consisting of -COOH and -H, and wherein  $x \geq 1$ . A further embodiment is a non-metal containing composition which can catalytically eliminate two biol. reactive species. Another embodiment is a method of enhancing elimination of reactive oxygen species in eukaryotic cells by contacting cells with a superoxide dismutase mimetic.

IC ICM A61K031-19  
 INCL 514574000  
 CC 1-12 (Pharmacology)  
 Section cross-reference(s): 25, 63  
 IT **583027-50-3P**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (carboxyfullerenes and use as superoxide dismutase mimetics and in increasing lifespan)

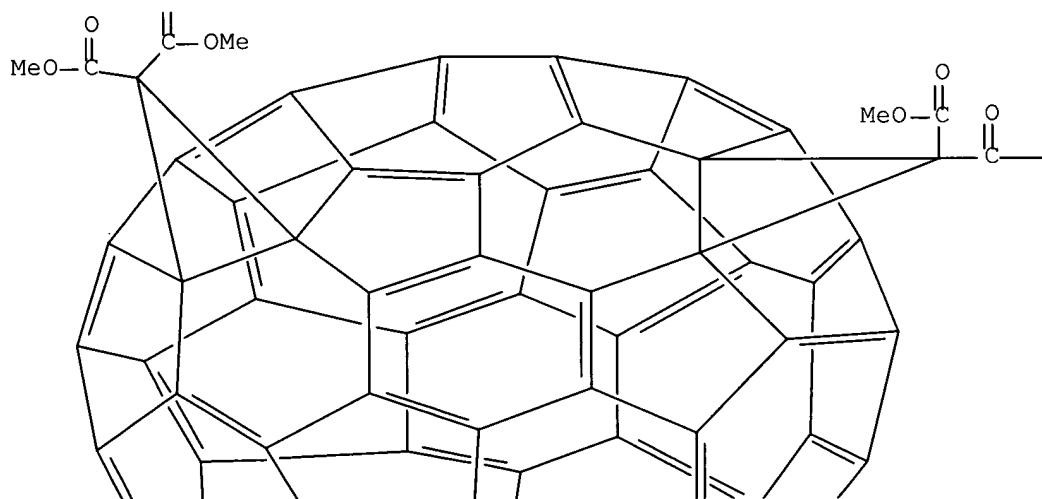
IT **583027-50-3P**  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
 (carboxyfullerenes and use as superoxide dismutase mimetics and in increasing lifespan)

RN 583027-50-3 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-3',3'',3''',3''',3''',3'''-hexacarboxylic acid, hexamethyl ester (9CI) (CA INDEX NAME)

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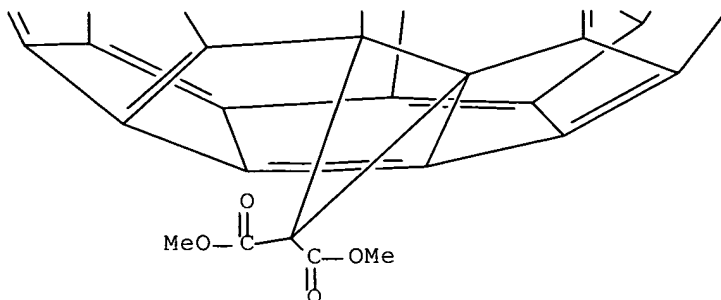
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L43 ANSWER 11 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2003:531546 HCAPLUS Full-text  
 DOCUMENT NUMBER: 139:108747  
 TITLE: Fullerene-containing dye and application such as optical recording materials, color composition for color filter, ink thereof  
 INVENTOR(S): Saito, Yasunori; Tsukahara, Hiroshi; Ogiso, Akira; Misawa, Tsutayoshi  
 PATENT ASSIGNEE(S): Mitsui Chemicals, Inc., Japan; Yamamoto Chemicals Inc.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 41 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: **Patent**  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003196881	A	20030711	JP 2002-256809	20020902
PRIORITY APPLN. INFO.:			JP 2001-265981	A 20010903
AB The invention relates to a fullerene dye disposed in an organic dye layer as an optical recoding layer on a substrate. The dye provides the good recording/reading characteristic using 300-500 nm light.				
IC ICM G11B007-24				
ICS B41M005-26; C08K003-04; C08L101-00; C09B057-00; C09D011-00; G11B007-004				
CC 74-12 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)				
Section cross-reference(s): 42, 73				
IT 99685-96-8D, [5,6]Fullerene-C60-Ih, di(N-Bu pyrrolido) derivs.				
140231-67-0	142131-92-8	146799-21-5	148085-32-9	149333-46-0
154133-70-7	155420-08-9	155662-47-8	155679-96-2	
156372-18-8	157368-25-7	158980-54-2	160606-42-8	169141-88-2
170244-42-5	175696-22-7	182758-81-2	183548-59-6	183628-98-0
195392-52-0	558480-80-1	558480-81-2	558480-82-3	558480-83-4
558480-84-5	558480-87-8	558480-88-9	558480-89-0	558480-90-3
558480-92-5	558480-99-2	558481-01-9	560069-84-3	560131-28-4
560131-32-0	560131-34-2			
RL: TEM (Technical or engineered material use); USES (Uses) (fluorene-containing dye for optical recording materials)				
IT 155420-08-9				
RL: TEM (Technical or engineered material use); USES (Uses)				

(fluorene-containing dye for optical recording materials)

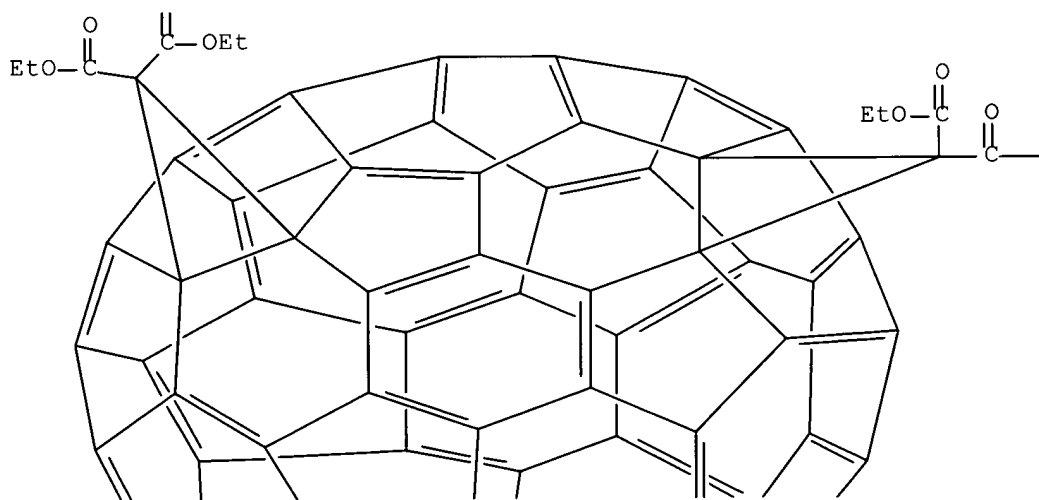
RN 155420-08-9 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
INDEX NAME)

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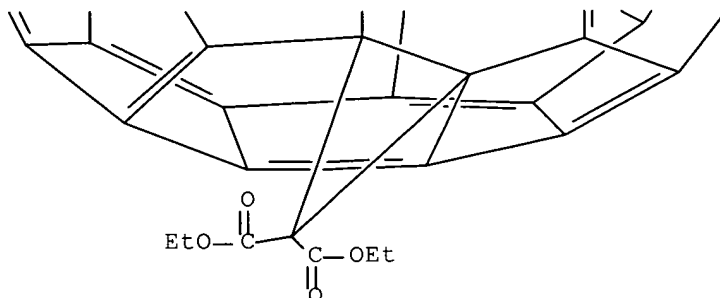
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L43 ANSWER 12 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 2003:374947 HCAPLUS Full-text

DOCUMENT NUMBER: 139:338424

TITLE: Amphiphilic and mesomorphic fullerene-based dendrimers  
AUTHOR(S): Guillon, Daniel; Nierengarten, Jean-Francois; Gallani, Jean-Louis; Eckert, Jean-Francois; Rio, Yannick; del Pilar Carreon, Maria; Dardel, Blaise; Deschenaux, Robert

CORPORATE SOURCE: Institut de Physique et Chimie des Materiaux de Strasbourg, Groupe des Materiaux Organiques, Strasbourg, 67037, Fr.

SOURCE: Macromolecular Symposia (2003), 192(7th Pacific Polymer Conference, 2001), 63-73  
CODEN: MSYMEC; ISSN: 1022-1360

PUBLISHER: Wiley-VCH Verlag GmbH &amp; Co. KGaA

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Growing attention is currently devoted to large dendritic structures for applications in nanotechnol. and materials science. In this respect, the incorporation of such compds. into thin ordered **films** appears to be an important issue. One of the most widely pursued approaches to structurally ordered dendrimer assemblies was the preparation of Langmuir **films** at the air-water interface. We report on the case of a diblock globular fullerene-based dendrimer and show that peripheral substitution of the dendrimer with hydrophobic chains on one hemisphere and hydrophilic groups on the other provides the required hydrophobic/hydrophilic balance allowing the formation of stable Langmuir **films**. A second approach was to consider the case of fullerene containing dendrimers terminated by mesogenic groups such as cyanobiphenyl subunits. Whatever the generation is, up to the fourth one, all these compds. exhibit a well-defined liquid crystalline smectic A phase. The mol. organization within the smectic layers is monolayered or bilayered

depending on the generation. For the smallest dendrimers, the organization is mainly governed by the size of the fullerene moiety, whereas for the higher ones, it is governed by the interactions between the terminal mesogenic groups. These two approaches appear particularly interesting for functional groups such as fullerenes, which are not well adapted to be organized in nanoscale architectures. The present study shows that fullerenes can indeed be introduced into different types of ordered structure when they were chemical adequately modified. 3',3''-(Methanoxymethano[1,3]benzenomethanoxymethano)-3'H,3''H-dicyclopropa[1,9:3,15][5,6]fullerene-C60-Ih-3',3''-dicarboxylic acid.

CC 36-5 (Physical Properties of Synthetic High Polymers)

Section cross-reference(s): 78

IT 155382-73-3D, functionalized, reaction products with benzyl alc. dendrimers, ether with hexadecanol and triethylene glycol monomethyl ether 183503-49-3D, cyanobiphenyl terminated

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(Langmuir monolayers of liquid crystalline amphiphilic and mesomorphic fullerene-based dendrimers)

IT 155382-73-3D, functionalized, reaction products with benzyl alc.

dendrimers, ether with hexadecanol and triethylene glycol monomethyl ether

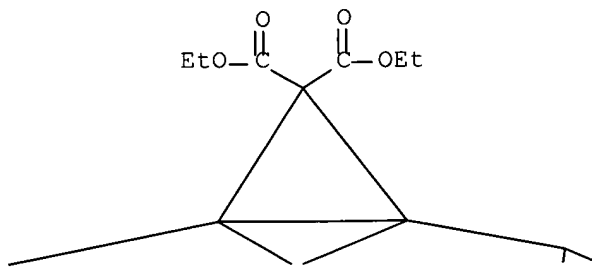
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process)

(Langmuir monolayers of liquid crystalline amphiphilic and mesomorphic fullerene-based dendrimers)

RN 155382-73-3 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:3,15][5,6]fullerene-C60-Ih-3',3',3'',3''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

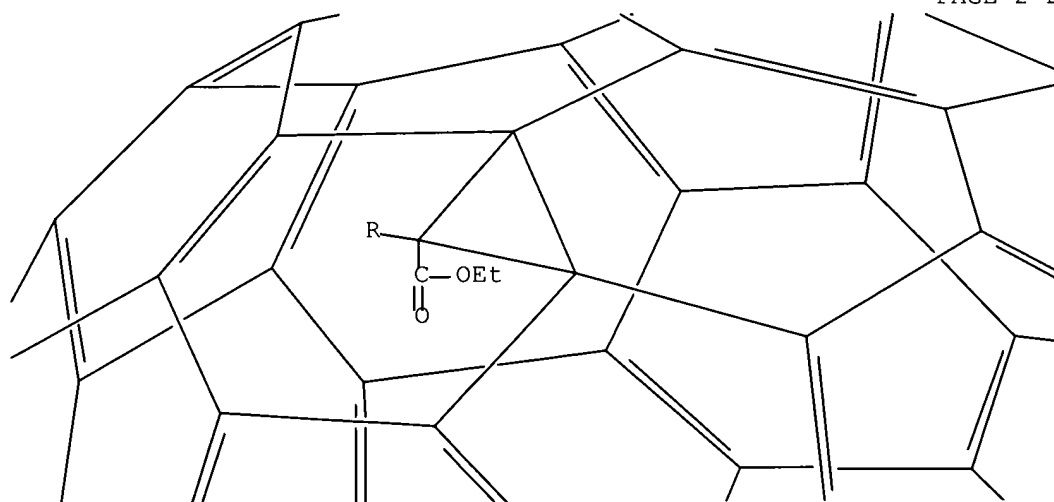
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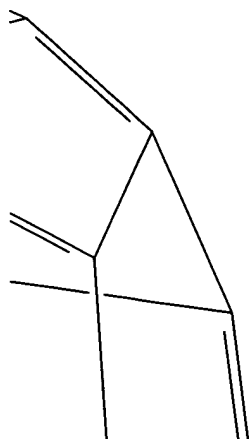
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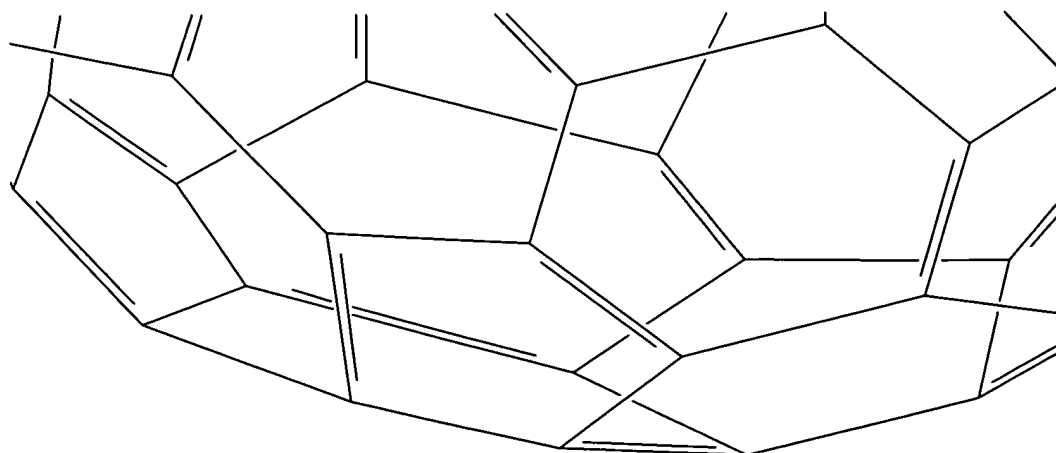
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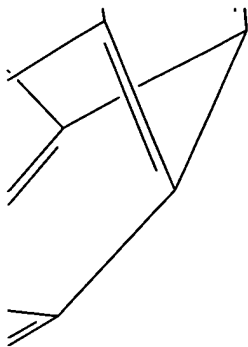
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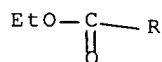
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REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 13 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
 ACCESSION NUMBER: 2003:97997 HCAPLUS Full-text  
 DOCUMENT NUMBER: 138:131176  
 TITLE: Fullerene derivatives that modulate nitric oxide synthase and calmodulin activity  
 INVENTOR(S): Wilson, Stephen R.; Wolff, Donald J.; Schuster, David I.; Richardson, Christine F.; Papoiu, Alexandru Dragos Petru; Alford, John Michael  
 PATENT ASSIGNEE(S): USA  
 SOURCE: U.S. Pat. Appl. Publ., 20 pp.  
 CODEN: USXXCO  
 DOCUMENT TYPE: **Patent**  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

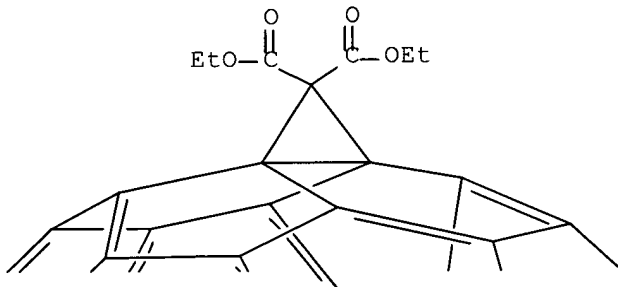
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 20030027870	A1	20030206	US 2002-147453	20020515
PRIORITY APPLN. INFO.:			US 2001-291462P	P 20010515
OTHER SOURCE(S):	MARPAT 138:131176			

AB The invention provides fullerene derivs., particularly fullerene derivs. that are water-soluble, that modulate the activity of nitric oxide synthase (NOS) and/or calmodulin. The invention provides methods for modulating NOS activity and particularly provides methods for inhibiting NOS activity, by contacting one or more fullerene derivs. of this invention with cells or tissue that exhibit NOS activity. In a specific embodiment, the invention provides water-soluble fullerene derivs. that are selective inhibitors of neuronal NOS or iNOS. Preferred water soluble fullerenes have substituents that contain one or more amine groups, amine cationic groups. More generally, water-soluble fullerenes of this invention contain one or more polar, charged, or

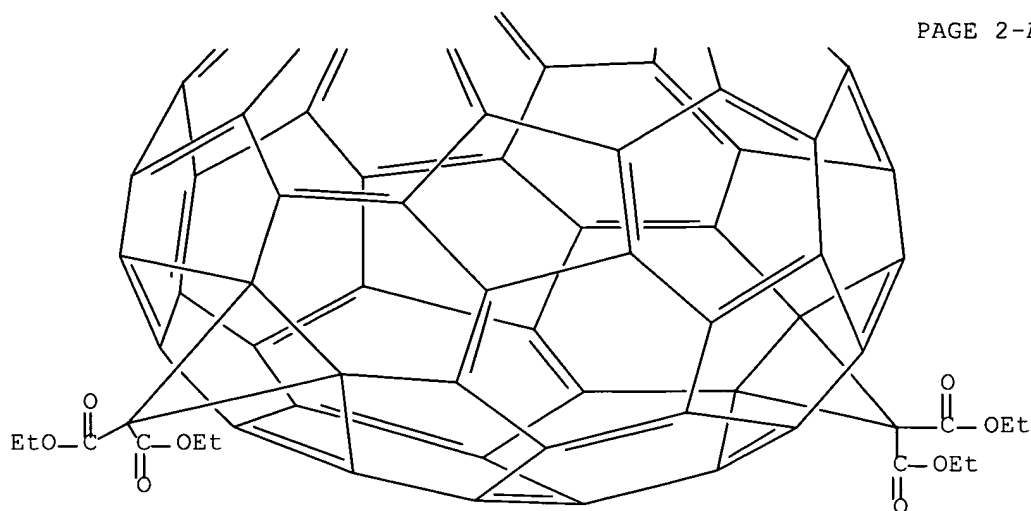
zwitterionic groups. Pharmaceutical compns. comprising fullerene derivs. of the invention are useful therapeutically, e.g. for the treatment and/or prevention of cancers and as anti-aging compns. Preparation of the fullerene derivs. is described.

IC ICM A61K031-135  
ICS A61K031-05  
INCL 514656000; 514732000  
CC 1-12 (Pharmacology)  
Section cross-reference(s): 25, 63  
IT 1663-67-8, Malonyl chloride 58885-58-8 73842-99-6 99685-96-8, C60  
Fullerene 153218-90-7 **155382-70-0** **155420-08-9**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(fullerene derivative modulators of NO synthase and calmodulin)  
IT **155382-70-0** **155420-08-9**  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(fullerene derivative modulators of NO synthase and calmodulin)  
RN 155382-70-0 HCAPLUS  
CN 3'H,3''H,3'''H-Tricyclopropa[1,9:34,35:43,57][5,6]fullerene-C60-Ih-  
3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
INDEX NAME)

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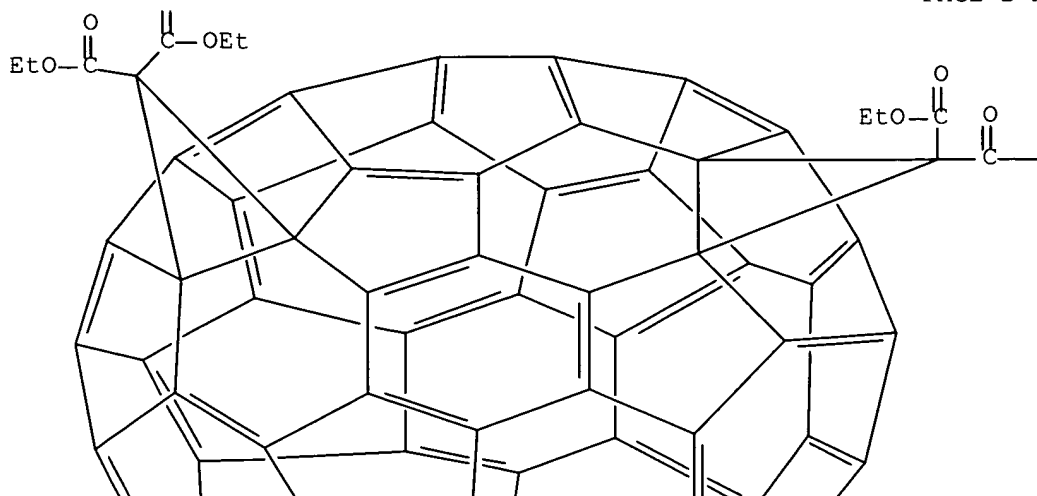
PAGE 2-A



RN 155420-08-9 HCAPLUS  
CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
INDEX NAME)

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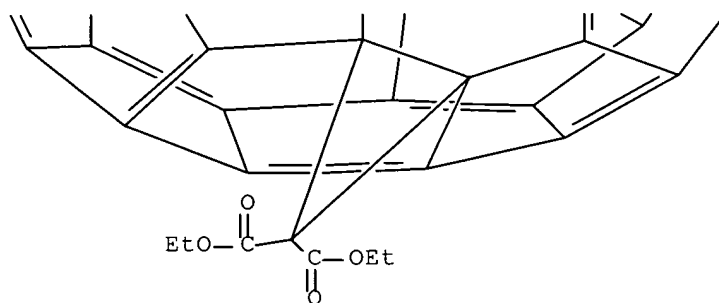
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L43 ANSWER 14 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:654292 HCAPLUS Full-text

DOCUMENT NUMBER: 132:28213

TITLE: Optical limiting of fullerenes. Why are the results so different in solution vs. in solid matrix?

AUTHOR(S): Sun, Ya-Ping; Riggs, Jason E.

CORPORATE SOURCE: Department of Chemistry and Center for Advanced

Engineering Fibers and Films, Howard L. Hunter  
Chemistry Laboratory, Clemson University, Clemson, SC,  
29634-1905, USA

SOURCE: Proceedings - Electrochemical Society (1999),  
99-12(Recent Advances in the Chemistry and Physics of  
Fullerenes and Related Materials), 398-410  
CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Optical limiting properties of methano[60]fullerene - di-Et malonate mono- and multiple-adducts were studied systematically. For all of the fullerene derivs. in room-temperature solution, observed optical limiting responses toward the second harmonic of a Q-switched Nd:YAG nanosecond pulsed laser are strongly concentration dependent. The strong concentration dependence is likely due to effects on optical limiting contributions that are associated with bimol. excited state processes in the fullerene derivs. Consistent with such effects, optical limiting responses of the mono-adduct in polymethylmethacrylate polymer **films** are much weaker than those in concentrated solns. but in excellent agreement with those in dilute solns. The results are explained in terms of a reverse saturable absorption mechanism that includes both unimol. and bimol. excited state processes of fullerenes.

CC 73-10 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)

IT Nonlinear optical absorption  
Optical limiting  
(of methano-C60 di-Et malonate adducts in solution and polymer **films**)

IT Excited state absorption  
Solvent effect  
(optical limiting of methano-C60 di-Et malonate adducts in solution and polymer **films**)

IT Fullerenes  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(optical limiting of methano-C60 di-Et malonate adducts in solution and polymer **films**)

IT Laser radiation  
(pulsed; optical limiting of methano-C60 di-Et malonate adducts in solution and polymer **films**)

IT 9011-14-7, Poly(methyl methacrylate)  
RL: NUU (Other use, unclassified); USES (Uses)  
(optical limiting of methano-C60 di-Et malonate adducts in polymer **films**)

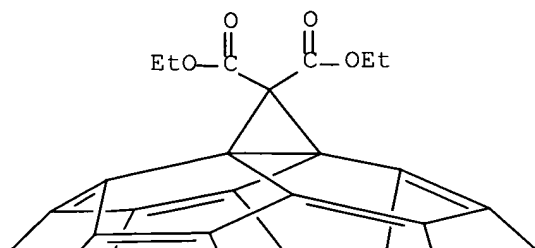
IT 155382-68-6 160768-45-6 188051-42-5  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(optical limiting of solns., and excited triplet state absorption)

IT 155382-68-6 160768-45-6 188051-42-5  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(optical limiting of solns., and excited triplet state absorption)

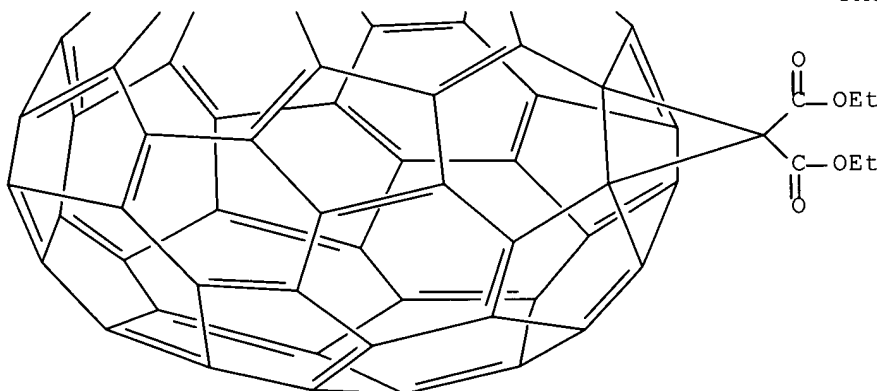
RN 155382-68-6 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:16,17][5,6]fullerene-C60-Ih-3',3'',3''',3'''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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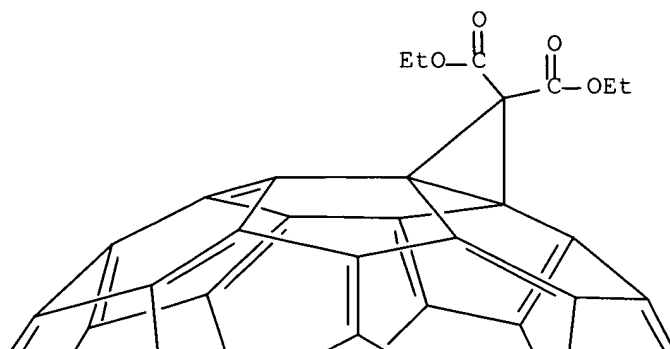


RN 160768-45-6 HCAPLUS  
 CN 3'H,3''H,3'''H,3''''H,3'''''H,3''''''H-  
 Hexacyclopropa[1,9:16,17:21,40:30,31:44,45:52,60][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3''',3''''',3''''',3''''',3''''',3''''',3''''',3''''''-  
 dodecacarboxylic acid, 3',3',3'',3'',3''',3''',3''''',3''''',3''''',3''''',3''''',3''''''-  
 ''''''',3''''''''-dodecaethyl ester (CA INDEX NAME)

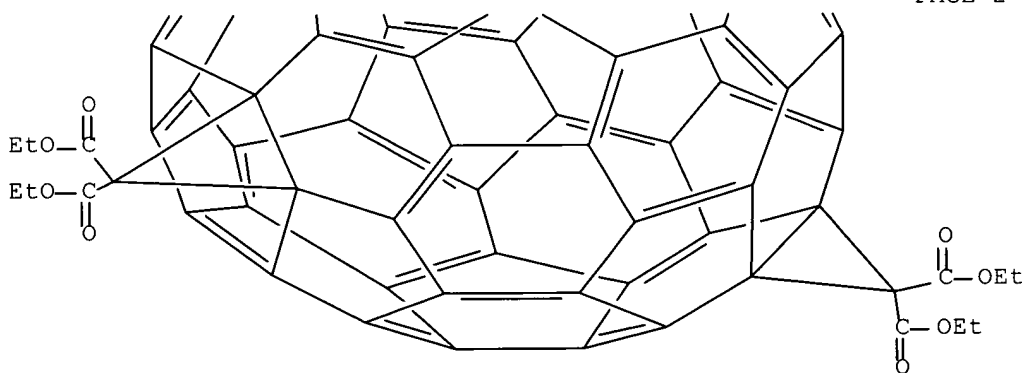
\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

RN 188051-42-5 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:32,33:43,57][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3''',3''''',3''''',3''''',3''''',3''''',3''''',3''''''-hexacarboxylic acid, hexaethyl ester (9CI) (CA INDEX NAME)

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REFERENCE COUNT: 17 THERE ARE 17 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 15 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1999:455745 HCAPLUS Full-text  
DOCUMENT NUMBER: 131:189995  
TITLE: Effects of hydrophobic-hydrophilic balance and stereochemistry on the supramolecular assembly of functionalized fullerenes  
AUTHOR(S): Tian, Yongchi; Fendler, Janos H.; Hungerbuhler, Hartmut; Guldi, Dirk M.; Asmus, Klaus-Dieter  
CORPORATE SOURCE: Department of Chemistry, Syracuse University, Syracuse, NY, 13244-4100, USA  
SOURCE: Materials Science & Engineering, C: Biomimetic and Supramolecular Systems (1999), C7(1), 67-73  
CODEN: MSCEEE; ISSN: 0928-4931  
PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Mol. assemblies of C60, mono-substituted by Et, C60[C(COOC2H5)2], 1a; Pr, C60[C(COOC3H7)2], 1b; dodecyl, C60[C(COOC12H25)2], 1c; and triethyleneglycol-monomethyl ether, C60[C(COO(CH2CH2O)3CH3)2], 1d, **esters** of **malonic** acid and three different regioisomeric bis-substituted isomers of C60, equatorial-C60[C(COOC2H5)2]2, 2a; trans3-C60[C(COOC2H5)2]2, 2b; and trans2-C60-[C(COOC2H5)2]2, 2c on water surfaces were investigated by surface pressure vs. surface area isotherms, Brewster-angle microscopy and absorption spectroscopy measurements. For the mono-adducts, true monolayer was demonstrated only from 1d while multilayer structures were formed from 1a, 1b and 1c upon compression. For the bis adducts, typical monolayer was seen only from 2c; in contrast no monolayers formed from upon spreading 2a and 2b on water, but monolayers and multilayers coexisted. All of the spread C60 derivs. could be transferred onto solid substrates by the Langmuir-Blodgett technique with transfer ratio close to unity.

CC 66-1 (Surface Chemistry and Colloids)  
Section cross-reference(s): 22

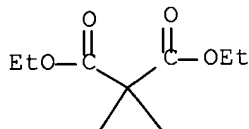
IT 153218-90-7 155382-66-4 155382-69-7  
155382-71-1 173201-37-1 173201-38-2 173201-39-3  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(effects of hydrophobic-hydrophilic balance and stereochem. on the supramol. assembly of functionalized fullerenes)

IT 155382-66-4 155382-69-7 155382-71-1  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(effects of hydrophobic-hydrophilic balance and stereochem. on the supramol. assembly of functionalized fullerenes)

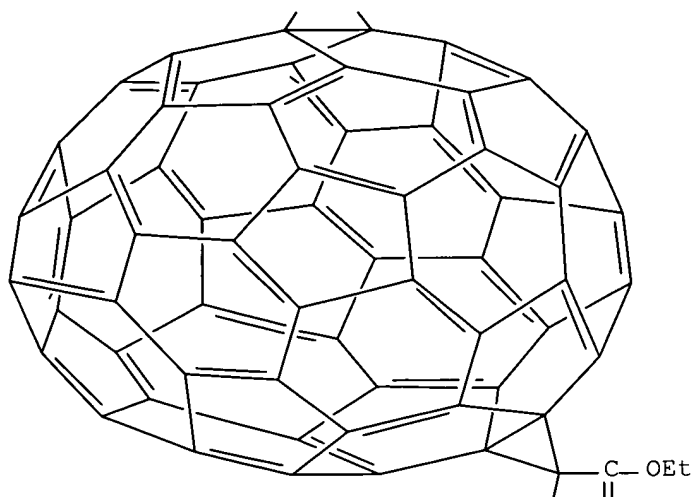
RN 155382-66-4 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:49,59][5,6]fullerene-C60-1h-3',3',3'',3''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

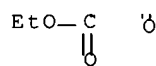
PAGE 1-A



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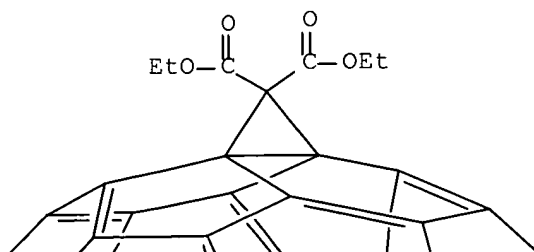


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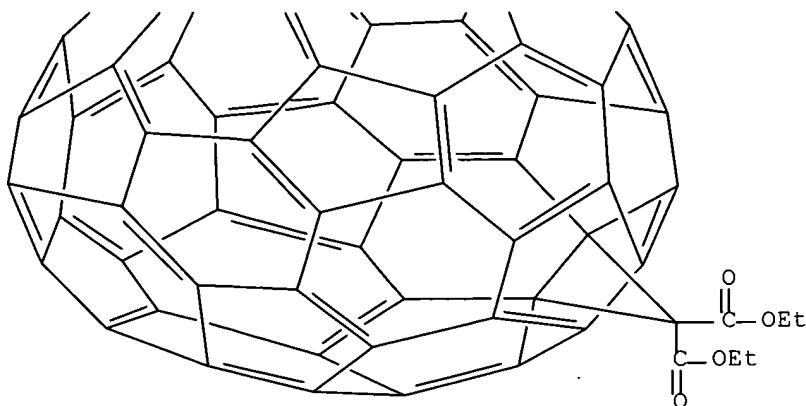


RN 155382-69-7 HCAPLUS  
 CN 3'H,3''H-Dicyclopropa[1,9:34,35][5,6]fullerene-C60-Ih-3',3',3'',3''-  
 tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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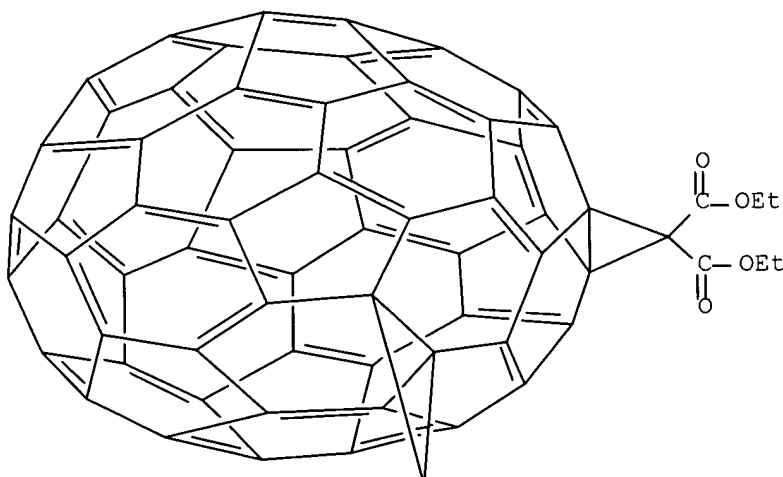


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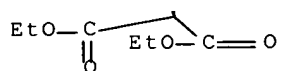


RN 155382-71-1 HCAPLUS  
 CN 3'H,3''H-Dicyclopropa[1,9:13,14][5,6]fullerene-C60-Ih-3',3'',3''',3'''-  
 tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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REFERENCE COUNT:

33

THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 16 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1999:15331 HCAPLUS Full-text

DOCUMENT NUMBER: 130:139001

TITLE: Formation of endohedral fullerene ions in mass spectrometry collision experiments

AUTHOR(S): Drewello, Th.; Kaseberg, L.; Herzs Schuh, R.

CORPORATE SOURCE: Department of Chemistry, University of Warwick, UK

SOURCE: Advances in Mass Spectrometry (1998), 14, A015800/1-A015800/8

CODEN: AMSPA; ISSN: 0568-000X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB Conference proceedings. The fragmentation pathways of pos. charged ions of fullerene derivs. ionized by EI are subject of this work. Unimol. dissocns. (MIKES) and bimol. dissocns. (CID) under various conditions were carried out with different exohedrally modified fullerenes. The MIKE spectra of 2-[spiro-C60]-malonic esters show some characteristic fragment ions, the structure of which could be elucidated by the use of three different ester groups. In high energy collision expts. the most abundant fragment is C60H<sup>+</sup>, which was formed by elimination of the ester groups and hydrogen rearrangement. After collisions with He no endohedral mol. ion, but endohedral fragment ions with relatively high intensities could be observed. Obviously, the amount of helium atoms penetrating the buckyball surface increases with the degree of derivatization. All measurements were carried out on a hybrid instrument of BEqQ (B = magnet, E = elec. sector, qQ = quadrupole system) geometry.

CC 22-8 (Physical Organic Chemistry)

Section cross-reference(s): 73

IT 7440-59-7, Helium, reactions 134932-61-9, C70 Fullerene ion(1+)

220132-94-5

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(reactant; formation of endohedral fullerene ions in mass spectrometry collision expts.)

IT 220132-94-5

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(reactant; formation of endohedral fullerene ions in mass spectrometry collision expts.)

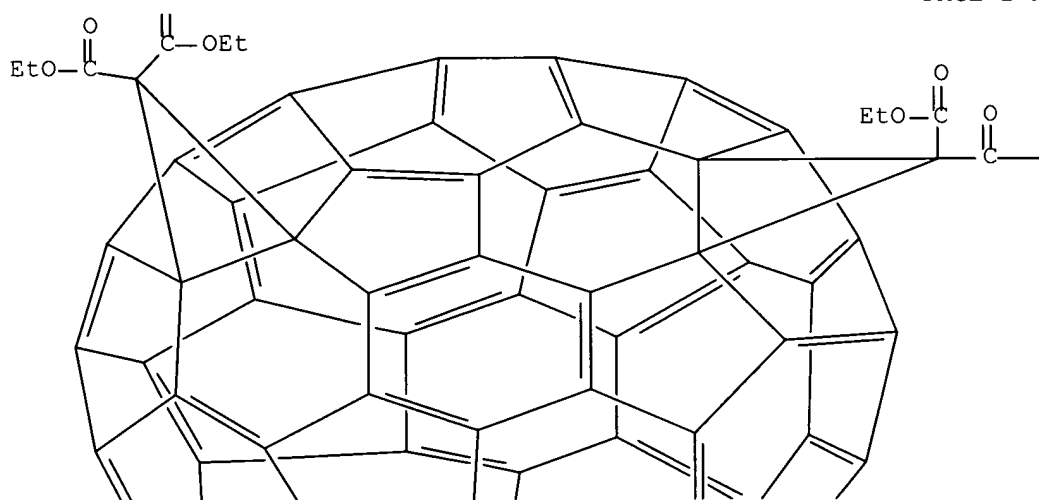
RN 220132-94-5 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-3',3',3'',3''',3''',3'''-hexacarboxylic acid, hexaethyl ester, radical ion(1+) (9CI) (CA INDEX NAME)

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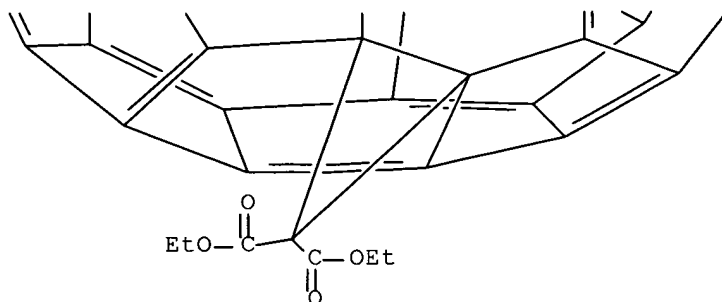
PAGE 2-A



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L43 ANSWER 17 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1998:496538 HCAPLUS Full-text

DOCUMENT NUMBER: 129:266960

ORIGINAL REFERENCE NO.: 129:54303a,54306a

TITLE: Redox characteristics of covalent derivatives of the higher fullerenes C70, C76, and C78

AUTHOR(S): Boudon, Corinne; Gisselbrecht, Jean-Paul; Gross, Maurice; Herrmann, Andreas; Ruettimann, Markus; Crassous, Jeanne; Cardullo, Francesca; Echegoyen, Luis; Diederich, Francois

CORPORATE SOURCE: Laboratoire d'Electrochimie et de Chimie Physique du Corps Solide UMR au CNRS No. 7512 Faculte de Chimie, Universite Louis Pasteur, Strasbourg, F-67008, Fr.

SOURCE: Journal of the American Chemical Society (1998), 120(31), 7860-7868

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The electrochem. properties of covalent derivs. of the higher fullerenes C70, C76, C2v-C78, and D3-C78, bearing bis(alkoxycarbonyl)methano addends, were investigated by cyclic voltammetry (CV) and/or steady-state voltammetry (SSV). Included in this study were a series of previously prepared mono- to tetrakisadducts of C70, monoadducts of C76, and bis- and trisadducts of C2v-C78 and D3-C78. For all compds., several (up to five) reduction steps and one or two oxidation steps were observed. The reduction steps usually required more energy than the corresponding processes in the parent fullerenes whereas the oxidation steps became facilitated with increasing degree of addition. A notable exception to this trend was the observation that two C76 monoadducts were more readily reduced than the parent fullerene and one was more difficult to oxidize. The electrochem. properties of C70 derivs. were found to closely resemble those of C60 adducts. Constitutional isomers displayed nearly identical redox characteristics. Only the first reduction process is reversible by CV or SSV in the entire series of C70 adducts whereas the electrochem. generated dianions of some of the derivs. underwent a rapid subsequent chemical reaction. The electrochem. of covalent adducts of C76 and C78 differs substantially from that of the derivs. of the smaller carbon spheres C60 and C70. Among all compds. studied, monoadducts of C76 are the easiest to be reduced or oxidized and their electrochem. generated multiple anions are much more stable under the conditions of the SSV and CV expts. than those of the adducts of C70 and the C78 isomers. Several of the electrochem. generated trisanions of the adducts of C78 isomers underwent rapid chemical

reactions. Indeed, a new bisadduct of C2v-C78, not detected in the regular synthetic mixture, was prepared via electrolysis of a trisadduct. This C2-sym. bisadduct seems to be present as an intermediate during every electrolysis of other bis- and trisadducts of C2v-C78.

CC 72-2 (Electrochemistry)

Section cross-reference(s): 25

IT 685-87-0D, **Bromomalonic acid diethyl ester**, reaction products with Fullerene-C78-C2v and Fullerene-C78-D3 139707-95-2D, [5,6]Fullerene-C78-D3, reaction products with di-Et  $\alpha$ -bromomalonate 139707-96-3D, [5,6]Fullerene-C78-C2v, reaction products with di-Et  $\alpha$ -bromomalonate 173202-46-5 173202-47-6 173202-48-7 **173202-49-8** 173202-50-1 **173202-51-2** 173202-56-7 184954-53-8 184954-54-9 213388-68-2  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (redox characteristics of covalent derivs. of C70, C76, and C78 fullerenes)

IT **173202-49-8 173202-51-2**

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (redox characteristics of covalent derivs. of C70, C76, and C78 fullerenes)

RN 173202-49-8 HCAPLUS

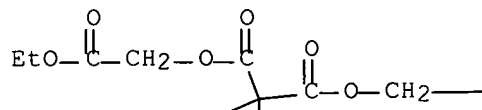
CN 3'H,3''H,3'''H,3''''H-Tetracyclopropa[7,22:33; 34:38,57:46,47][5,6]fullerene-C70-D5h(6)-3',3',3'',3'',3''',3''',3''',3''''-octacarboxylic acid, 3'',3'',3''',3''''-tetrakis(2-ethoxy-2-oxoethyl) 3',3',3''',3''''-tetraethyl ester (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

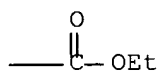
RN 173202-51-2 HCAPLUS

CN 3'H,3''H,3'''H,3''''H-Tetracyclopropa[7,22:17,18:46,47:53,54][5,6]fullerene-C70-D5h(6)-3',3',3'',3'',3''',3''',3''',3''''-octacarboxylic acid, 3''',3''',3''',3''''-tetrakis(2-ethoxy-2-oxoethyl) 3',3',3''',3''''-tetraethyl ester (9CI) (CA INDEX NAME)

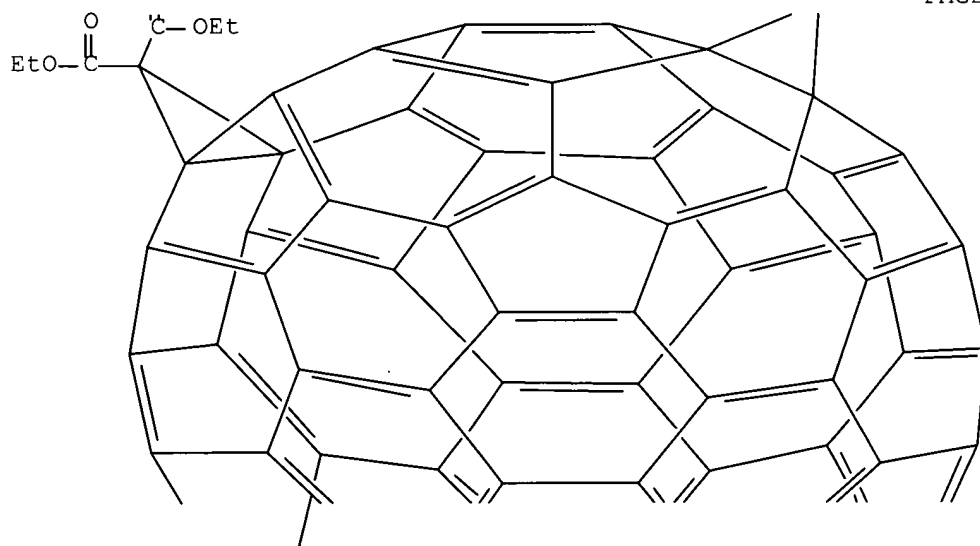
PAGE 1-A

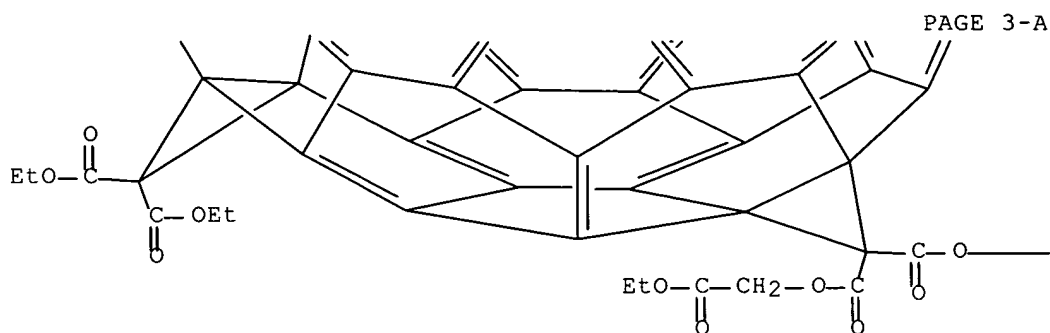


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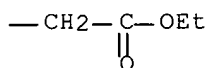


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REFERENCE COUNT: 81 THERE ARE 81 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 18 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1997:812177 HCAPLUS Full-text

DOCUMENT NUMBER: 128:70789

ORIGINAL REFERENCE NO.: 128:13691a,13694a

TITLE: The use of carboxylated buckminsterfullerenes for treatment of neurotoxic injury

INVENTOR(S): Choi, Dennis Wonkyu; Dugan, Laura; Linn, Tien-Sung Tom; Luh, Tien-Yah

PATENT ASSIGNEE(S): F. Hoffmann-La Roche A.-G., Switz.

SOURCE: PCT Int. Appl., 26 pp.

CODEN: PIXXD2

DOCUMENT TYPE: **Patent**

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9746227	A1	19971211	WO 1997-EP2679	19970526
W: AL, AU, BA, BB, BG, BR, CA, CN, CZ, EE, GE, HU, IL, IS, JP, KP, KR, LK, LR, LT, LV, MG, MK, MN, MX, NO, NZ, PL, RO, SG, SI, SK, TR, TT, UA, UZ, VN, YU, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				

CA 2255913	A1	19971211	CA 1997-2255913	19970526
CA 2255913	C	20070731		
AU 9731672	A	19980105	AU 1997-31672	19970526
AU 720528	B2	20000601		
EP 904070	A1	19990331	EP 1997-927037	19970526
EP 904070	B1	20000315		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, PT, IE, FI				
CN 1221340	A	19990630	CN 1997-195219	19970526
BR 9709636	A	19990810	BR 1997-9636	19970526
AT 190486	T	20000415	AT 1997-927037	19970526
ES 2145608	T3	20000701	ES 1997-927037	19970526
JP 2000514412	T	20001031	JP 1998-500167	19970526
US 6265443	B1	20010724	US 1997-867378	19970602
KR 2000016238	A	20000325	KR 1998-709809	19981202
GR 3033646	T3	20001031	GR 2000-401333	20000612

## PRIORITY APPLN. INFO.:

US 1996-18899P	P	19960603
US 1997-37007P	P	19970131
WO 1997-EP2679	W	19970526

AB The use of carboxylated buckminsterfullerenes in the control or treatment of neurotoxic injury is provided. Preparation and neuroprotective activity of carboxyfullerene C60[C(COOH)2]3 are described.

IC ICM A61K031-19  
ICS A61K031-215

CC 1-11 (Pharmacology)  
Section cross-reference(s): 25, 63

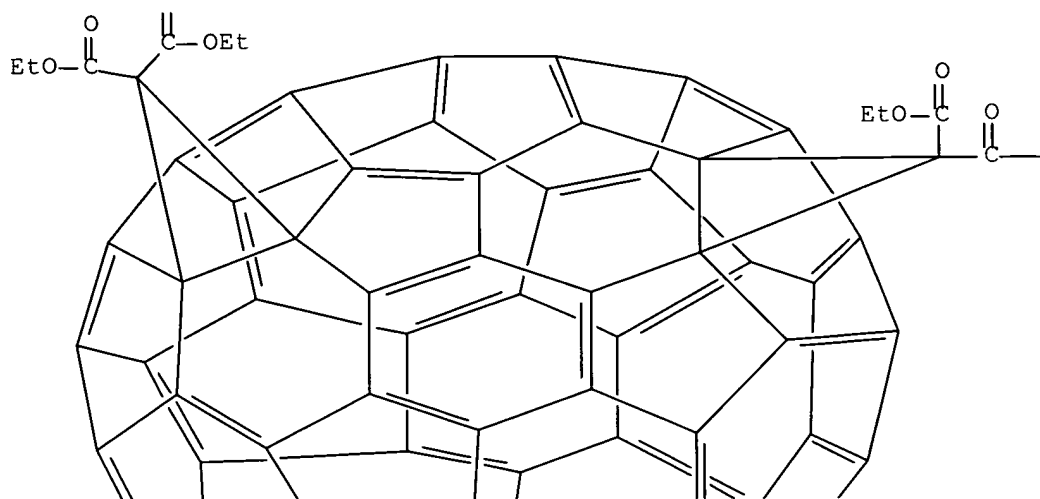
IT **155420-08-9P**  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(carboxylated buckminsterfullerenes for neurotoxic injury treatment)

IT **155420-08-9P**  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(carboxylated buckminsterfullerenes for neurotoxic injury treatment)

RN 155420-08-9 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA INDEX NAME)

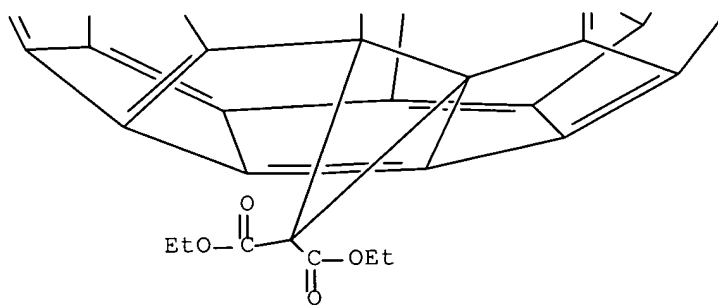
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L43 ANSWER 19 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1997:435071 HCAPLUS Full-text  
DOCUMENT NUMBER: 127:323790  
ORIGINAL REFERENCE NO.: 127:63391a,63394a  
TITLE: The aqueous electrochemistry of C<sub>60</sub> and  
methanofullerene films

AUTHOR(S): Davis, Jason J.; Hill, H. Allen O.; Kurz, Arnd;  
 Leighton, Andrew D.; Safronov, Alex Y.  
 CORPORATE SOURCE: Inorganic Chemistry Laboratory, South Parks Road,  
 University of Oxford, Oxford, UK  
 SOURCE: Journal of Electroanalytical Chemistry (1997),  
 429(1-2), 7-11  
 CODEN: JECHES  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB C60 and methanofullerene **films** give an unexpected electrochem. response in aqueous solution - sharply different from the, now well characterized, responses in acetonitrile. A comparison is made between the **film** and solution responses of carboxylate and Et ester adducts. The large differences observed may be accounted for by a specific ordering of the acid functions on the gold electrode surface.

CC 72-2 (Electrochemistry)  
 Section cross-reference(s): 25, 66, 78

ST aq electrochem fullerene C60 methanofullerene **film**; mol orientation methanofullerene gold electrode; malonic acid fullerene deriv aq electrochem; gold electrode aq electrochem fullerene methanofullerene

IT Electrochemistry  
**Films**  
 (aqueous electrochem. of C60 and methanofullerene **films**)

IT Cyclic voltammetry  
 (of C60 and methanofullerene **films** on gold in aqueous tetrabutylammonium bromide solution)

IT 99685-96-8, C60 Fullerene 153218-90-7 **155382-69-7**  
 159717-72-3 159717-73-4  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (aqueous electrochem. of C60 and methanofullerene **films** on gold)

IT 7440-57-5, Gold, uses  
 RL: DEV (Device component use); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
 (cyclic voltammetry of C60 and methanofullerene **films** on gold in aqueous tetrabutylammonium bromide solution)

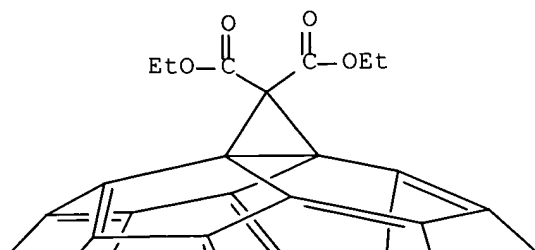
IT 1643-19-2, Tetrabutylammonium bromide  
 RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
 (cyclic voltammetry of C60 and methanofullerene **films** on gold in aqueous tetrabutylammonium bromide solution)

IT **155382-69-7**  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (aqueous electrochem. of C60 and methanofullerene **films** on gold)

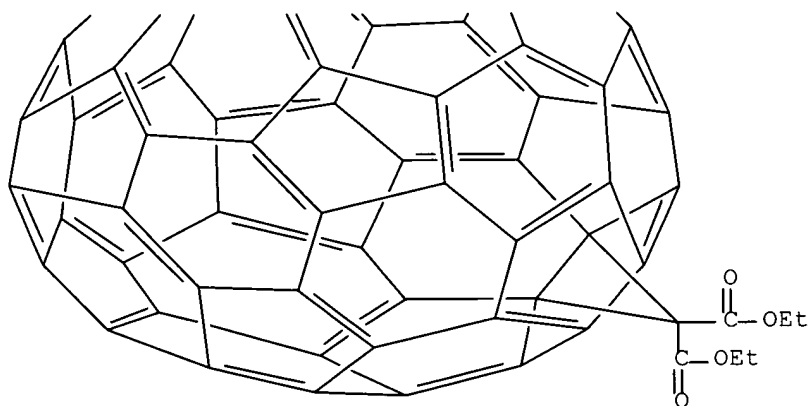
RN 155382-69-7 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:34,35][5,6]fullerene-C60-Ih-3',3',3'',3''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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REFERENCE COUNT: 29 THERE ARE 29 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L43 ANSWER 20 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1997:116469 HCAPLUS Full-text  
DOCUMENT NUMBER: 126:131260  
ORIGINAL REFERENCE NO.: 126:25360h,25361a  
TITLE: Preparation of unsymmetrical, bis adducts of C70  
fullerenes  
INVENTOR(S): Bingel, Carsten  
PATENT ASSIGNEE(S): Hoechst A.-G., Germany  
SOURCE: Ger. Offen., 12 pp.  
CODEN: GWXXBX  
DOCUMENT TYPE: **Patent**  
LANGUAGE: German  
FAMILY ACC. NUM. COUNT: 1

## PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 19521626	A1	19961219	DE 1995-19521626	19950614
WO 9700235	A1	19970103	WO 1996-EP2395	19960603

W: CA, JP, US  
RW: AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE

PRIORITY APPLN. INFO.: DE 1995-19521626 A 19950614

OTHER SOURCE(S): MARPAT 126:131260

GI For diagram(s), see printed CA Issue.

AB The title compds. [I; C70 = fullerene moiety; E1-E4 = (un)substituted CO<sub>2</sub>H, CHO, CN, (un)substituted organic moiety, etc.], useful as electrooptical materials (no data), are prepared through successive cyclopropanations of a C70 fullerene with  $\alpha$ -halo-CH-acid compds. Thus, bis(tert-butoxycarbonyl)methano-(C70)-fullerene was reacted with di-Et bromomalonate, forming, as the major product, fullerene II and, fullerene isomer III.

IC ICM C07C069-743  
ICS C07C219-24; C07J051-00; C01B031-00; C07D207-46; C07D209-48;  
C07D213-64; C07D249-18

ICA C07J009-00; C07C069-38

ICI C07M009-00

CC 25-29 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
Section cross-reference(s): 24, 74

IT **170503-91-0P**  
RL: BYP (Byproduct); PREP (Preparation)  
(preparation of unsym. bis adducts of C70 fullerenes)

IT **170503-90-9P**  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of unsym. bis adducts of C70 fullerenes)

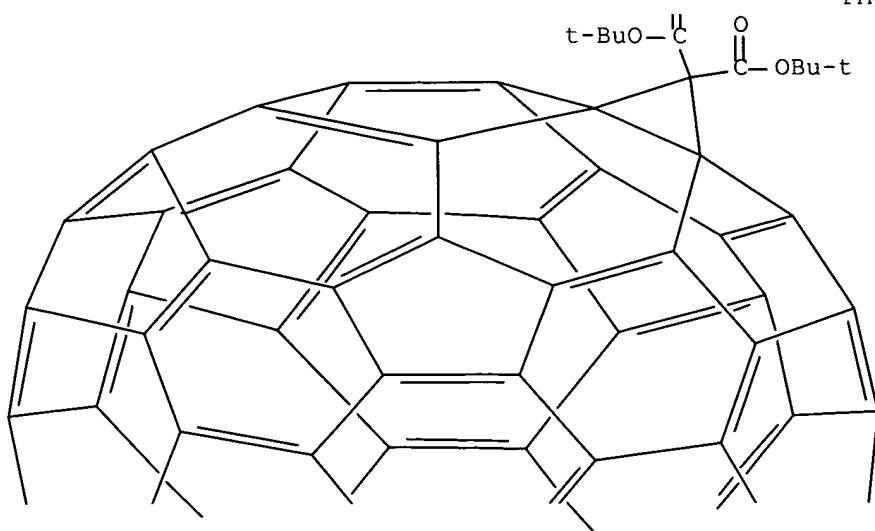
IT **170503-91-0P**  
RL: BYP (Byproduct); PREP (Preparation)  
(preparation of unsym. bis adducts of C70 fullerenes)

RN 170503-91-0 HCAPLUS

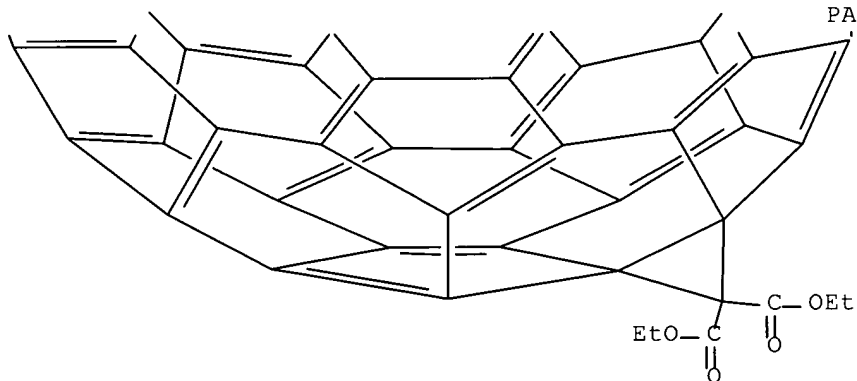
CN 3'H,3''H-Dicyclopropa[8,25:16,35][5,6]fullerene-C70-D5h(6)-3',3',3'',3''-tetracarboxylic acid, 3',3'-bis(1,1-dimethylethyl)-3'',3''-diethyl ester  
(9CI) (CA INDEX NAME)

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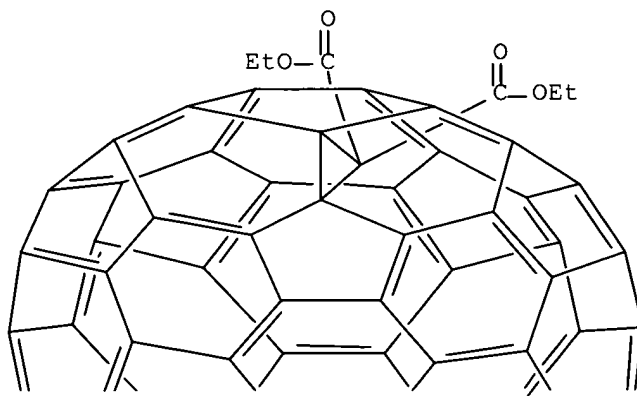
IT 170503-90-9P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of unsym. bis adducts of C70 fullerenes)

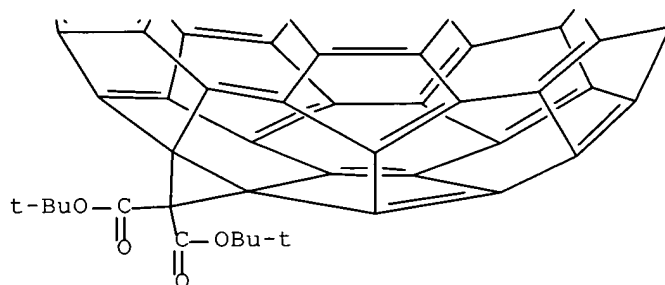
RN 170503-90-9 HCAPLUS

CN 3'H,3''H-Dicyclopropa[8,25:33,34][5,6]fullerene-C70-D5h(6)-3',3',3'',3''-  
 tetracarboxylic acid, 3',3'-bis(1,1-dimethylethyl) 3'',3''-diethyl ester  
 (9CI) (CA INDEX NAME)

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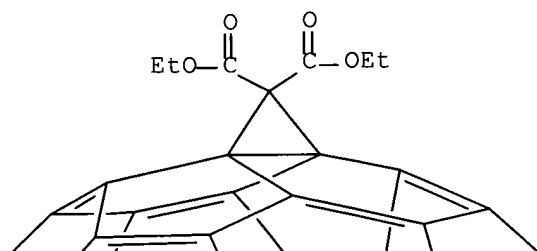
L43 ANSWER 21 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1996:570740 HCAPLUS Full-text  
DOCUMENT NUMBER: 125:309608  
ORIGINAL REFERENCE NO.: 125:57758h,57759a  
TITLE: Systematic 3-dimensional approach for the design of  
stable monolayers and Langmuir Blodgett **films** of  
C<sub>60</sub>, by means of functionalization  
AUTHOR(S): Guldi, Dirk M.; Asmus, Klaus-Dieter; Tian, Yongchi;  
Fendler, Janos H.  
CORPORATE SOURCE: Radiation Lab., Univ. Notre Dame, Notre Dame, IN,  
46556, USA  
SOURCE: Proceedings - Electrochemical Society (1996),  
96-10 (Recent Advances in the Chemistry and Physics of  
Fullerenes and Related Materials, Vol. 3), 501-508  
CODEN: PESODO; ISSN: 0161-6374  
PUBLISHER: Electrochemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English

- AB Functionalization of C60 (at > 1 positions by functional groups of different hydrophobicities) is shown to provide a viable control over the supramol. structures formed upon spreading these compds. on H2O surfaces. Stable and high quality **films** can be formed from all the studied mono-functionalized derivs. (1a, 1b, 1c, and 1d), although only 1d possesses the appropriate amphiphilic character to form a true monomol. layer. The controlled variation of the stereochem. positioning of 2 functional groups on C60 has significant consequences regarding the coexistence of mono- and multilayer structures. Thus, placement of a 2nd bis(ethoxycarbonyl)methylene group on nearly the opposite site of the fullerene core (2c) is sufficient to prevent strong hydrophobic interactions among the fullerene moieties and to stabilize fullerene monolayers at the air-water interface. Placing the 2nd substituent closer to the position of the 1st eliminates the possibility of H bond formation and thus multilayer formation is observed upon spreading of the equatorial (2a) and trans3 isomers (2b) on H2O surfaces. Formation of a stable and high quality monolayer upon compression ( $\leq 35$  mN/m) was found for tris-functionalized equatorial-C60[C(COOEt)2]3 (3), while compression beyond this pressure resulted in irreversible transformation to rods with porous and oriented structures.
- CC 66-1 (Surface Chemistry and Colloids)  
Section cross-reference(s): 29, 36
- ST fullerene C60 functional group monolayer stability; Langmuir Blodgett **film** fullerene functional group
- IT Surface pressure  
(-area isotherms; fullerene C60 functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- IT Adsorbed substances  
Substituent effect  
(fullerene C60 functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- IT Fullerenes  
RL: PRP (Properties)  
(fullerene functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- IT **Films**  
(Langmuir-Blodgett, fullerene functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- IT 99685-96-8D, [5,6]Fullerene-C60-Ih, derivs. 153218-90-7  
**155382-66-4 155382-68-6 155382-69-7**  
**155420-08-9** 173201-37-1 173201-38-2 173201-39-3  
RL: PRP (Properties)  
(fullerene C60 functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- IT **155382-66-4 155382-68-6 155382-69-7**  
**155420-08-9**  
RL: PRP (Properties)  
(fullerene C60 functional group effects on monolayer stability and Langmuir-Blodgett **film** preparation)
- RN 155382-66-4 HCAPLUS
- CN 3'H,3''H-Dicyclopropa[1,9:49,59][5,6]fullerene-C60-Ih-3',3'',3''',3'''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

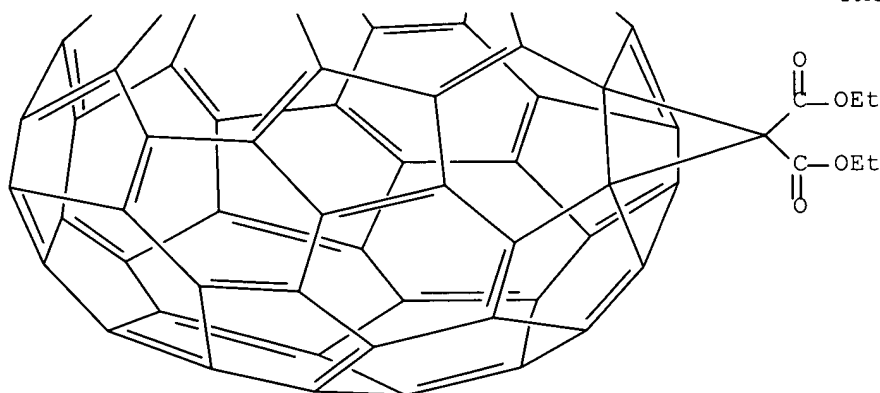
CCOC(=O)C(C)(C)C(=O)OCC
$$\text{EtO}-\overset{\underset{\text{O}}{\parallel}}{\text{C}}$$

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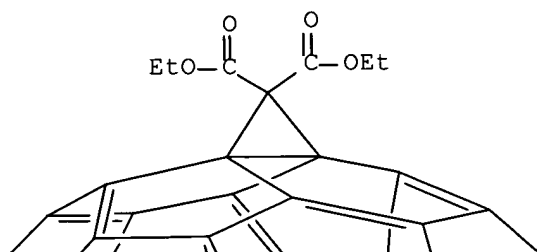


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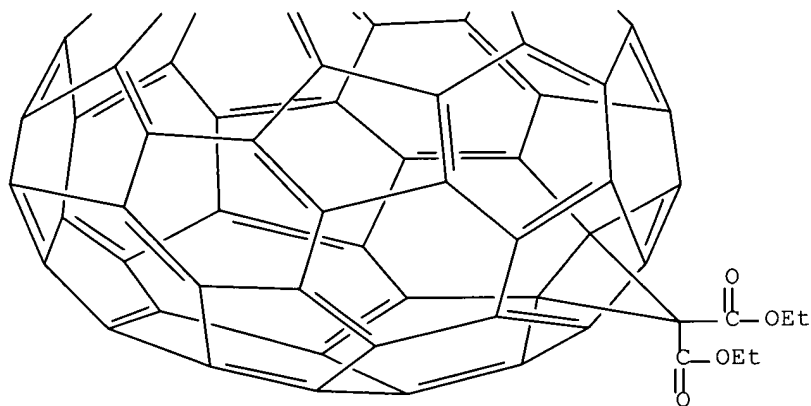


RN 155382-69-7 HCAPLUS  
CN 3'H,3''H-Dicyclopropa[1,9:34,35][5,6]fullerene-C60-Ih-3',3',3'',3''-  
tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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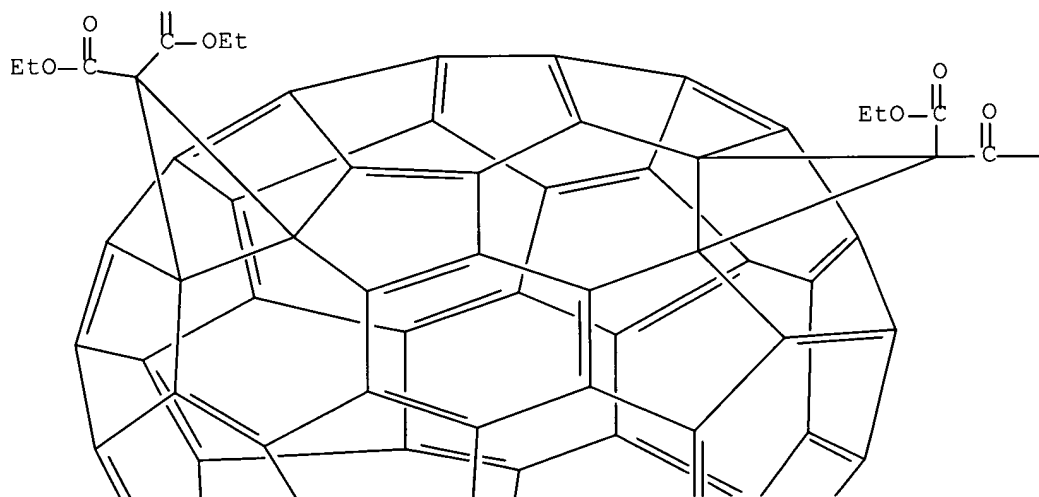


RN 155420-08-9 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
 INDEX NAME)

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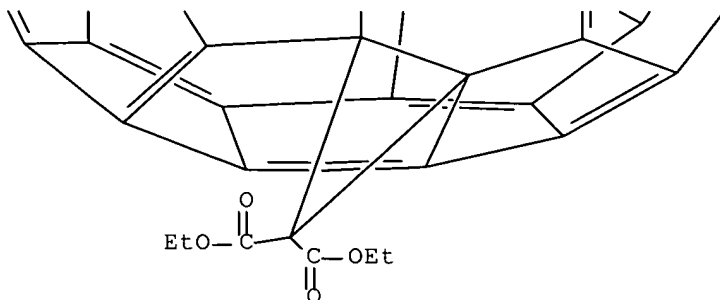
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L43 ANSWER 22 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1996:83176 HCAPLUS Full-text

DOCUMENT NUMBER: 124:186258

ORIGINAL REFERENCE NO.: 124:34275a,34278a

TITLE: Compression-Dependent Structural Changes of Functionalized Fullerene Monolayers

AUTHOR(S): Guldi, Dirk M.; Tian, Yongchi; Fendler, Janos H.; Hungerbuehler, Hartmut; Asmus, Klaus-Dieter

CORPORATE SOURCE: Department of Chemistry, Syracuse University, Syracuse, NY, 13244-4100, USA

SOURCE: Journal of Physical Chemistry (1996), 100(8), 2753-8  
CODEN: JPCHAX; ISSN: 0022-3654

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Surface pressure vs. surface area isotherm, Brewster angle microscopic, and atomic force microscopic measurements provided evidence for the formation of a stable monolayer upon the compression, up to 35 mN/m, of hexaethyl-1,2:18,36:22,23-tris(methano[60]fullerene-61,61,62,62,63,63-hexacarboxylate), e,e,e-C60[C(COOEt)2]3, on the water surface in a Langmuir film balance. Compression to higher pressures reorganized the monolayers into bilayers and resulted ultimately in the irreversible transformation to rods (1  $\mu$ m diameter and up to 100  $\mu$ m long) with porous and oriented structures.

CC 66-1 (Surface Chemistry and Colloids)

IT 155420-08-9

RL: PEP (Physical, engineering or chemical process); PROC (Process) (compression-dependent structural changes of functionalized fullerene monolayers)

IT 155420-08-9

RL: PEP (Physical, engineering or chemical process); PROC (Process) (compression-dependent structural changes of functionalized fullerene monolayers)

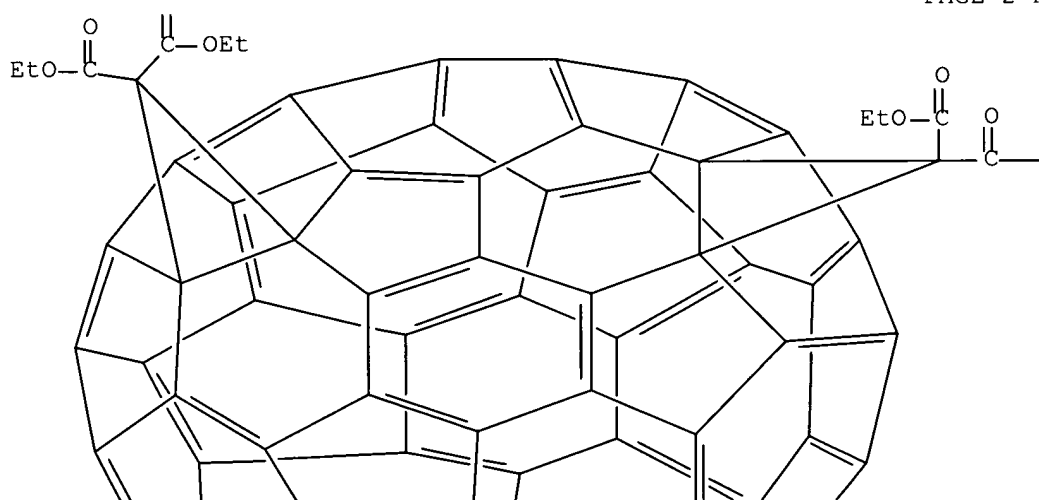
RN 155420-08-9 HCAPLUS

CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-3',3'',3''',3'''',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA INDEX NAME)

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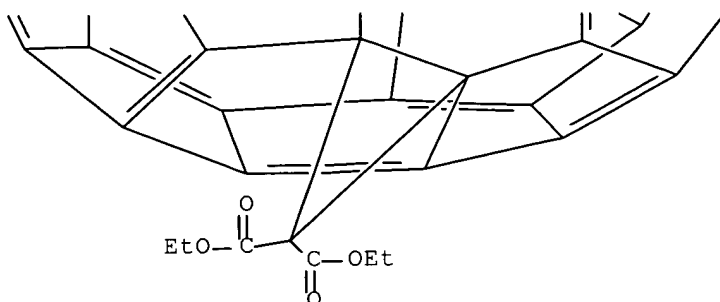
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L43 ANSWER 23 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1995:991488 HCAPLUS Full-text

DOCUMENT NUMBER: 124:131108

ORIGINAL REFERENCE NO.: 124:24119a

TITLE: Redox and excitation studies with C60 substituted  
**malonic acid diethyl esters**AUTHOR(S): Guldi, Dirk M.; Hungerbuehler, Hartmut; Asmus,  
Klaus-DieterCORPORATE SOURCE: Hahn-Meitner-Inst. Berlin GmbH, Bereich Physikalische  
Chemie, Berlin, 14109, GermanySOURCE: Proceedings - Electrochemical Society (1995),  
95-10 (Proceedings of the Symposium on Recent Advances  
in the Chemistry and Physics of Fullerenes and Related  
Materials, 1995), 449-56  
CODEN: PESODO; ISSN: 0161-6374

PUBLISHER: Electrochemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Physicochem. properties, such as excited triplet states, reductive quenching by diazabicyclooctane, pulse radiolytic-induced formation of  $\pi$ -radical anions, transient absorption spectra, and electrochem. reduction, sensitively reflect the site and degree of functionalization of C60. The studied fullerenes were obtained via single, double, and triple cyclopropylation of C60 with **bromomalonic acid di-Et ester**. A strong blue shift for the excited triplet state of almost 100 nm, relative to plain C60, can be rationalized in terms of gradual destruction of the fullerenes  $\pi$ -system with increasing number of bis(ethoxycarbonyl)methylene groups. This coincides with a slow-down of the rate for reductive quenching of the excited triplet states by DABCO which ams. to nearly three orders of magnitude for 3(equatorial-C60[C(COOEt)2]3) of as compared with 3C60. An almost linear relation is observed between the energy of the characteristic  $\pi$ -radical anion absorption band in the near IR and the number of bis(ethoxycarbonyl)methylene groups attached to the fullerene. These absorptions range from 1080 nm to 1015 nm for C60- and equatorial-(C60 $\bullet$ -)[C(COOEt)2]3, resp. A corresponding trend emerges from cyclic voltammetry measurements on the redox potentials, showing a difference of 330 mV between reduction of C60 and equatorial-C60[C(COOEt)2]3.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other  
Reprographic Processes)

Section cross-reference(s): 72

IT 153218-90-7 155382-66-4 155382-68-6

155382-69-7 155382-71-1 155420-08-9

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT

(Reactant); PROC (Process); RACT (Reactant or reagent)  
(photolytic formation of excited triplet states and their reductive  
quenching with DABCO)

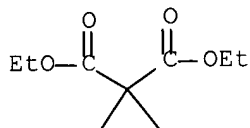
IT 155382-66-4 155382-68-6 155382-69-7  
155382-71-1 155420-08-9

RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT  
(Reactant); PROC (Process); RACT (Reactant or reagent)  
(photolytic formation of excited triplet states and their reductive  
quenching with DABCO)

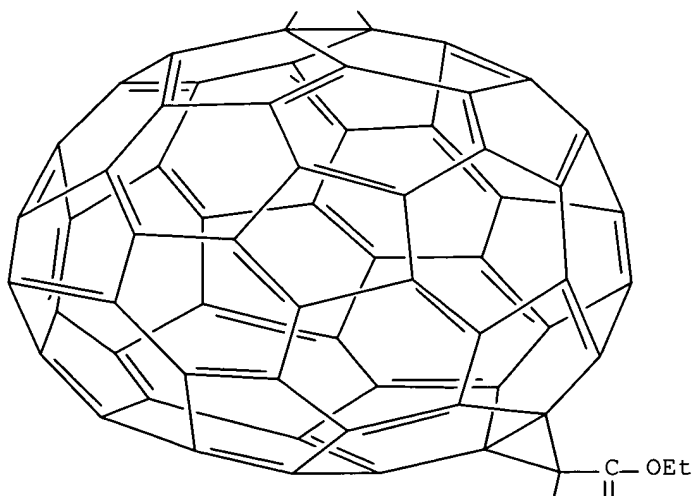
RN 155382-66-4 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:49,59][5,6]fullerene-C60-Ih-3',3',3'',3''-  
tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

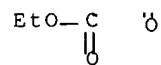
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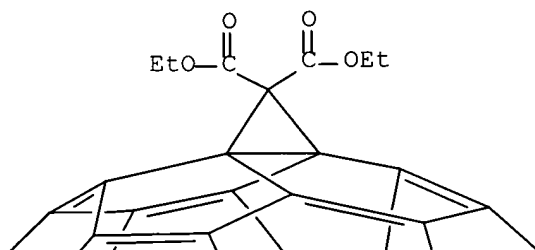


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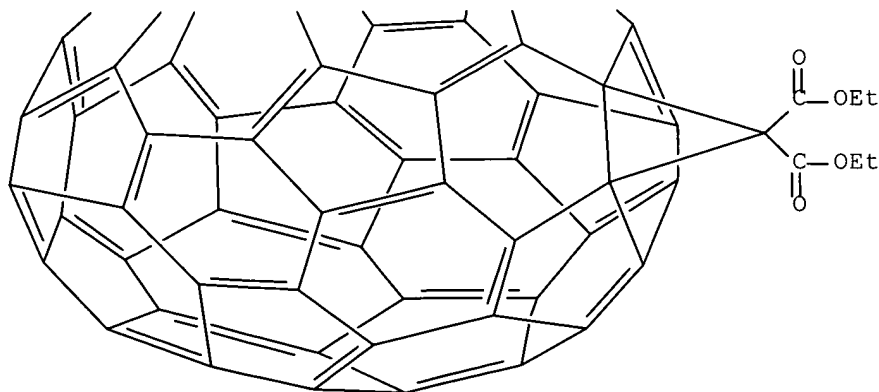


RN 155382-68-6 HCAPLUS  
 CN 3'H,3''H-Dicyclopropa[1,9:16,17][5,6]fullerene-C60-Ih-3',3',3'',3''-  
 tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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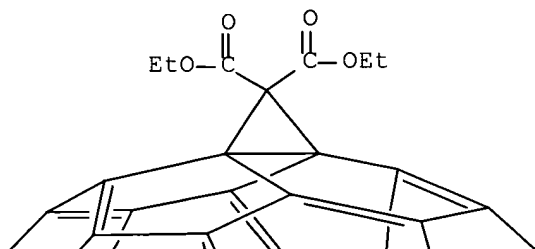


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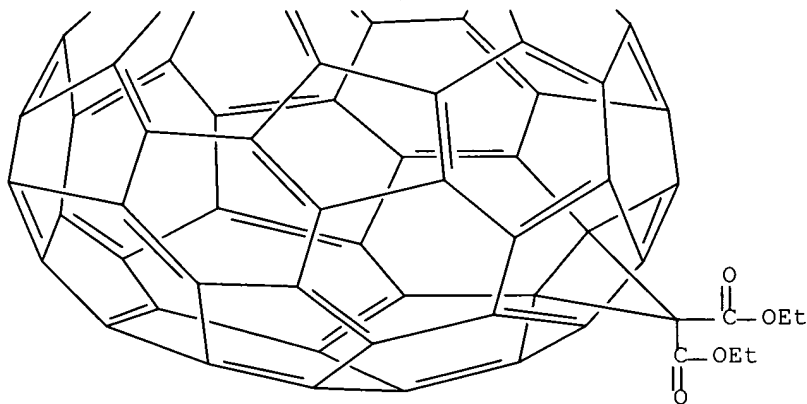


RN 155382-69-7 HCAPLUS  
 CN 3'H,3''H-Dicyclopropa[1,9:34,35][5,6]fullerene-C60-Ih-3',3',3'',3''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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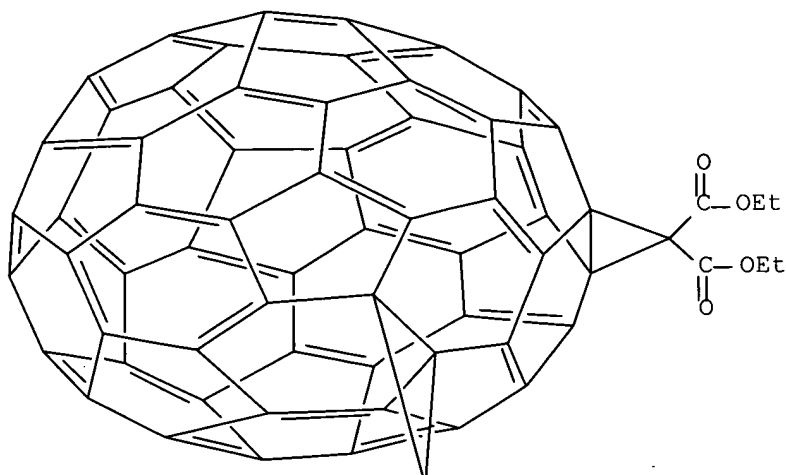


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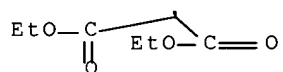


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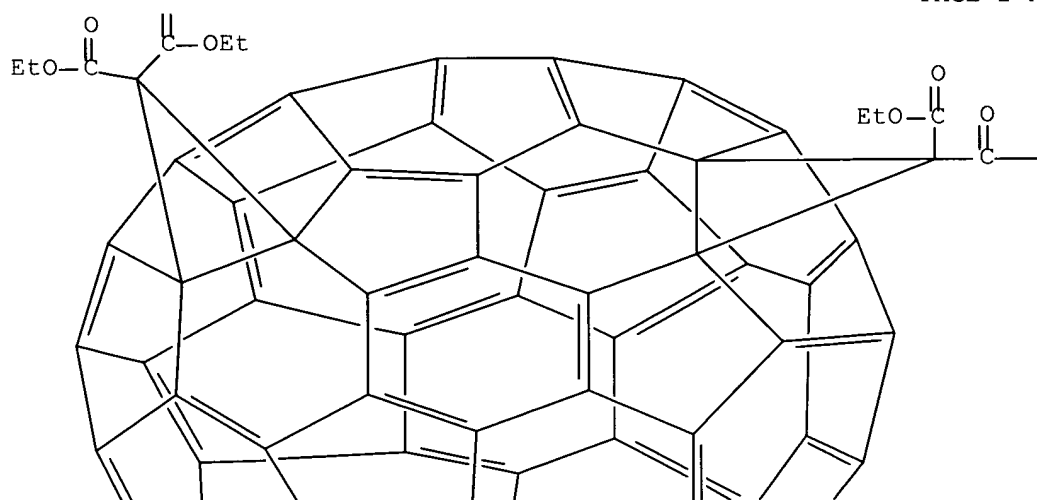
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 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
 INDEX NAME)

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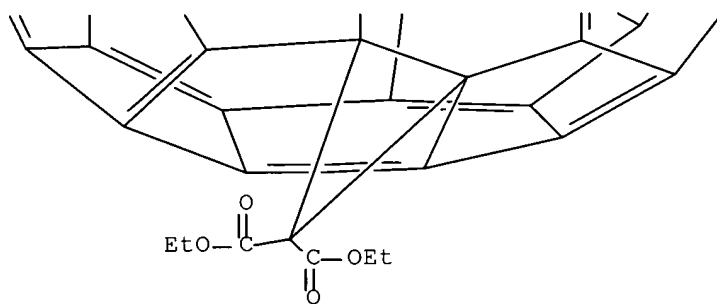
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L43 ANSWER 24 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN  
ACCESSION NUMBER: 1995:937247 HCAPLUS Full-text  
DOCUMENT NUMBER: 124:145585  
ORIGINAL REFERENCE NO.: 124:27069a,27072a  
TITLE: Multiple cyclopropanations of C<sub>70</sub>. Synthesis and

characterization of bis-, tris-, and tetrakis-adducts and chiroptical properties of bis-adducts with chiral addends, including a recommendation for the configurational description of fullerene derivatives with a chiral addition pattern

AUTHOR(S): Herrmann, Andreas; Ruettimann, Markus; Thilgen, Carlo; Diederich, Francois

CORPORATE SOURCE: Laboratorium Organische Chemie, ETH-Zentrum, Zurich, CH-8092, Switz.

SOURCE: Helvetica Chimica Acta (1995), 78(7), 1673-704  
CODEN: HCACAV; ISSN: 0018-019X

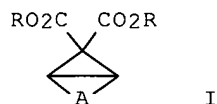
PUBLISHER: Verlag Helvetica Chimica Acta

DOCUMENT TYPE: Journal

LANGUAGE: English

OTHER SOURCE(S): CASREACT 124:145585

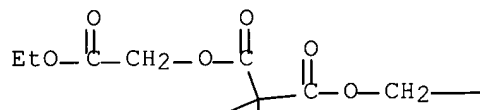
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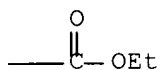
AB The regioselectivity of multiple cyclopropanations of C70 with 2-bromopropanedioates in the presence of DBU as base (Bingel reaction) was investigated in a systematic study. Bis-adduct formation occurred preferentially at the 6-6 bonds formed by the most pyramidalized sp<sup>2</sup>-C atoms at the 2 opposite poles of the fullerene and yielded 3 constitutionally isomeric bis(methano)fullerenes of type I (A = fullerene C70 residue; R = CH<sub>2</sub>CO<sub>2</sub>Et; II) in the reaction with achiral bis[(ethoxycarbonyl)methyl] 2-bromopropanedioate. Two of them with C<sub>2</sub>-symmetry were chiral, a fact which had not been considered in previous investigations. Formation of a third, C<sub>2v</sub>-sym. isomer was observed for the 1st time. Configurational descriptions for fullerene derivs. which possess a chiral chromophore as a result of specific functionalization patterns are proposed. Cyclopropanations of C70 with optically active bis[(S)-1-phenylbutyl] 2-bromopropanedioate yielded 5 optically active, C<sub>2</sub>-sym. bis-adducts of type I [R = (S)-CHPrPh] which were separated by preparative HPLC and fully characterized. Four of them represent 2 constitutionally isomeric pairs of diastereoisomers, and their CD spectra showed pronounced Cotton effects mainly due to strong chiroptical contributions from the chirally functionalized fullerene chromophores. Since the addition patterns on the fullerene surface in each pair of diastereoisomers had an enantiomeric relationship, their CD spectra closely resembled those expected for 2 enantiomers. In the 3rd constitutional isomer, the addition pattern on the fullerene surface was C<sub>2v</sub>-sym., and optical activity only results from the chiral addends. Its CD spectrum showed weak Cotton effects mainly from induced CD originating from the perturbation of the achiral fullerene chromophore by the attached chiral addends. Addition of di-Et 2-bromopropanedioate (2 equivalent) to the C<sub>2</sub>-sym. racemic bis-adduct of type II yielded a mixture of tris-adducts and 1 major, C<sub>2</sub>-sym. tetrakis-adduct which was isolated. Starting from the achiral C<sub>2v</sub>-sym. bis-adduct of type II, 1 single C<sub>s</sub>-sym. tris- and 1 C<sub>2v</sub>-sym. tetrakis-adduct were obtained as major products which were isolated and fully characterized. The regioselectivity for introduction of a 2nd addend in the same hemisphere of C70 is high and resembles the preferred pattern of bis-addition seen in the functionalization of C60.

CC 25-29 (Benzene, Its Derivatives, and Condensed Benzenoid Compounds)  
 IT 685-87-0, **Bromomalonic acid diethyl ester** 1663-67-8,  
 Propanedioyl dichloride 22135-49-5, (S)-1-Phenyl-1-butanol  
 115383-22-7, [5,6]Fullerene-C70-D5h(6) 173202-55-6  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (for preparation of multi-cyclopropanated C70 fullerenes)  
 IT 173202-50-1P **173202-51-2P** 173202-52-3P 173202-53-4P  
 173202-54-5P 173326-16-4P 173326-17-5P  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and CD spectra of multi-cyclopropanated C70 fullerenes)  
 IT 173202-46-5P **173202-49-8P** 173202-57-8P 173202-58-9P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of multi-cyclopropanated C70 fullerenes)  
 IT **173202-51-2P**  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and CD spectra of multi-cyclopropanated C70 fullerenes)  
 RN 173202-51-2 HCAPLUS  
 CN 3'H,3''H,3'''H,3''''H-Tetracyclopropa[7,22:17,18:46,47:53,54][5,6]fulleren  
 e-C70-D5h(6)-3',3',3'',3'',3''',3''',3''',3''''-octacarboxylic acid,  
 3''',3''',3''',3''''-tetrakis(2-ethoxy-2-oxoethyl)  
 3',3',3'',3''-tetraethyl ester (9CI) (CA INDEX NAME)

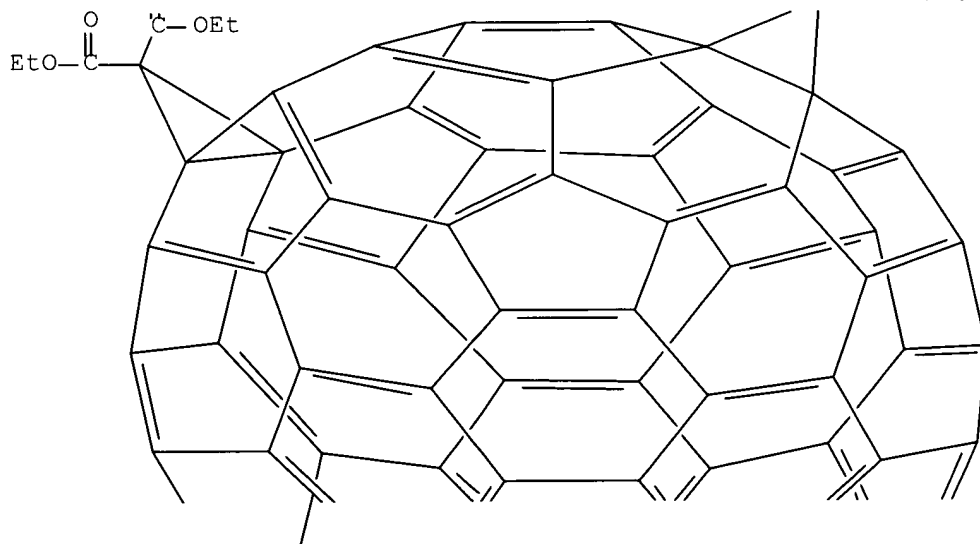
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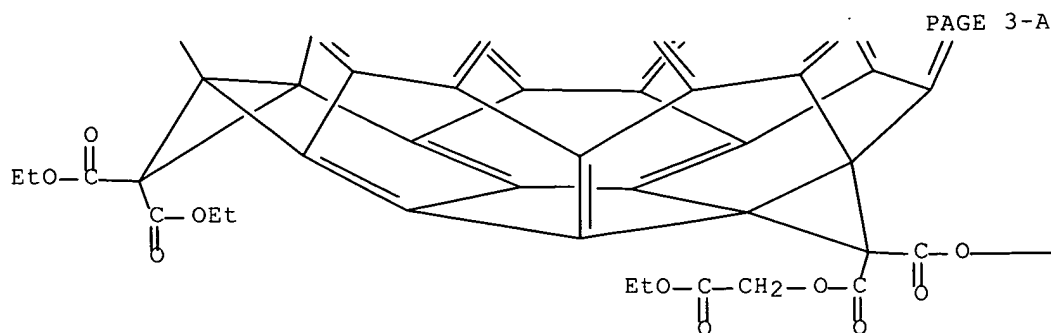


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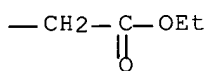


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IT 173202-49-8P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of multi-cyclopropanated C70 fullerenes)

RN 173202-49-8 HCAPLUS

CN 3'H,3''H,3'''H,3''''H-Tetracyclopropa[7,22:33;  
34:38,57:46,47][5,6]fullerene-C70-D5h(6)-  
3',3'',3''',3''',3''',3''',3''',3''''-octacarboxylic acid,  
3'',3''',3''',3''''-tetrakis(2-ethoxy-2-oxoethyl)  
3',3',3''',3''''-tetraethyl ester (9CI) (CA INDEX NAME)

\*\*\* STRUCTURE DIAGRAM IS NOT AVAILABLE \*\*\*

L43 ANSWER 25 OF 25 HCAPLUS COPYRIGHT 2008 ACS on STN

ACCESSION NUMBER: 1995:579070 HCAPLUS Full-text

DOCUMENT NUMBER: 123:212822

ORIGINAL REFERENCE NO.: 123:37649a,37652a

TITLE: Redox and Excitation Studies with C60-Substituted  
**Malonic Acid Diethyl Esters**

AUTHOR(S): Guldi, Dirk M.; Hungerbuehler, Hartmut; Asmus,  
Klaus-Dieter

CORPORATE SOURCE: Bereich Physikalische Chemie, Hahn-Meitner-Institut  
Berlin, Berlin, 14109, Germany

SOURCE: Journal of Physical Chemistry (1995), 99(23), 9380-5  
CODEN: JPCHAX; ISSN: 0022-3654

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Flash photolytic formation of excited triplet states, their consecutive reductive quenching with diazabicyclooctane (DABCO), and pulse radiolytic formation of  $\pi$ -radical anions of various C60-derivs. have been recorded. The fullerenes were functionalized via single, double, and triple cyclopropylation of C60 with **bromomalonic acid di-Et ester**. Flash photolytic irradiation at 308 exhibited a strong blue shift of  $\lambda_{\text{max}}$  by nearly 100 nm as compared to plain 3C60. This is rationalized in terms of a gradual destruction of the fullerene's  $\pi$ -system with an increasing number of bis(ethoxycarbonyl)methylene groups. The blue shift coincides with a significant slow down for the rate of reductive quenching of the excited triplet states by DABCO, i.e.,  $1.3 \times 10^6 \text{ M}^{-1} \text{ s}^{-1}$  vs  $2.5 \times 10^9 \text{ M}^{-1} \text{ s}^{-1}$  for the quenching of 3(equatorial-C60[C(COOEt)2]3) and 3C60, resp. The radical-induced reduction of functionalized C60 has been studied in a toluene/acetone/2-propanol mixture by means of time-resolved pulse radiolysis with measurements being conducted in the characteristic near-IR region. An almost linear dependence is obtained between the energy of the most significant IR- $\pi$ -radical anion band vs. the number of bis(ethoxycarbonyl)methylene groups at the fullerene core, with the resp.  $\lambda_{\text{max}}$  ranging from 1080 nm for C60•- to 1015 nm for equatorial-(C60•-)[C(COOEt)2]3. A corresponding trend emerges from cyclic voltammetry measurements on the redox potential in toluene/2-propanol. They show a difference of 30 mV between the formation of C60•- ( $E_{1/2} = -0.55 \text{ V}$  vs SCE) and the first reduction of equatorial-C60[C(COOEt)2]3 ( $E_{1/2} = -0.86 \text{ V}$  vs SCE). It appears that all these physicochem. parameters very sensitively reflect the site and degree of functionalization of C60.

CC 74-1 (Radiation Chemistry, Photochemistry, and Photographic and Other Reprographic Processes)

IT 150304-28-2 153218-90-7 155382-66-4 155382-68-6 155382-69-7 155382-71-1 155420-08-9  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (photolytic formation of excited triplet states and their reductive quenching with diazabicyclooctane)

IT 155382-66-4 155382-68-6 155382-69-7 155382-71-1 155420-08-9  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
 (photolytic formation of excited triplet states and their reductive quenching with diazabicyclooctane)

RN 155382-66-4 HCAPLUS

CN 3'H,3''H-Dicyclopropa[1,9:49,59][5,6]fullerene-C60-Ih-3',3',3'',3''-tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

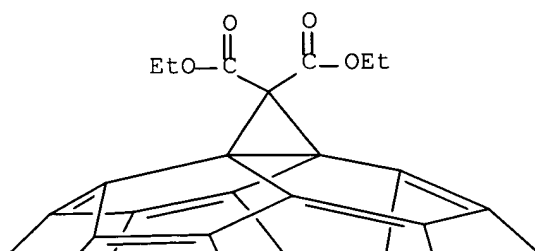
CCOC(=O)C(C)(C)C(=O)OCC

The diagram shows a C<sub>60</sub> fullerene molecule, which is a truncated icosahedron composed of 32 pentagonal and hexagonal rings. A single ethoxy group (-OEt) is attached to one of the carbon atoms on the surface of the cage.

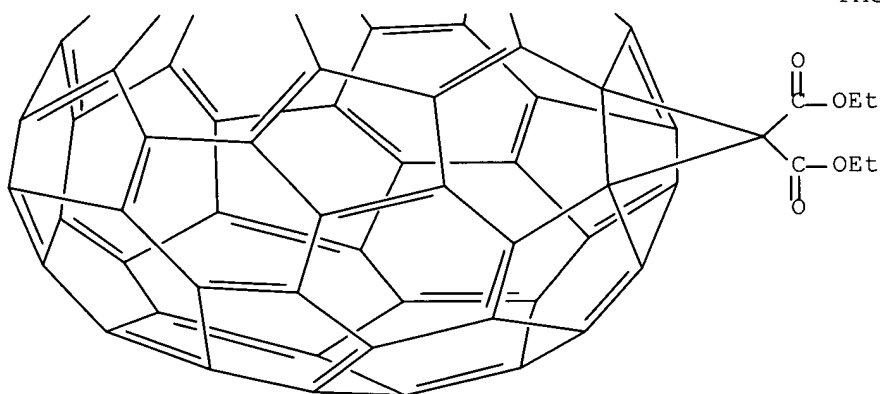
$$\text{EtO}-\text{C}(=\text{O})-\text{O}-$$

81

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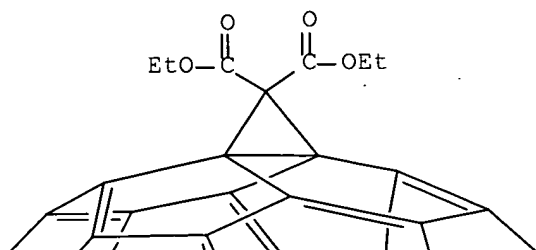


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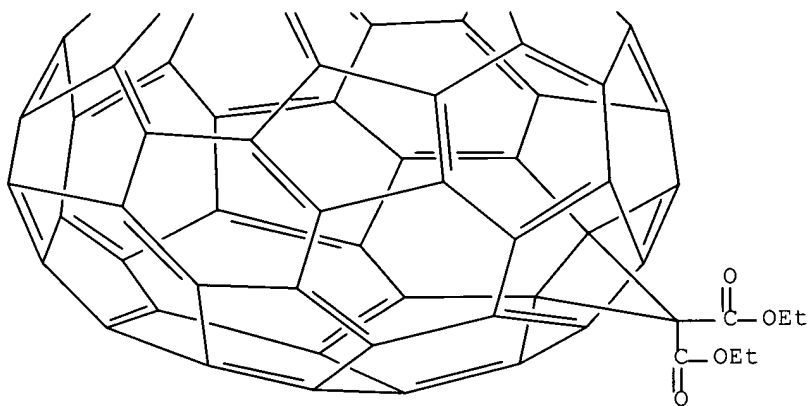


RN 155382-69-7 HCAPLUS  
CN 3'H,3''H-Dicyclopropa[1,9:34,35][5,6]fullerene-C60-Ih-3',3',3'',3''-  
tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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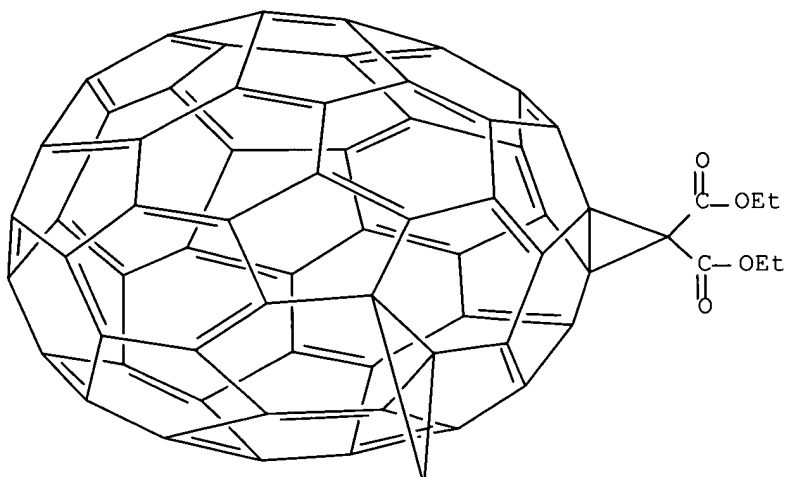


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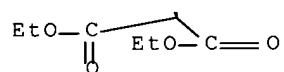


RN 155382-71-1 HCAPLUS  
CN 3'H,3''H-Dicyclopropa[1,9:13,14][5,6]fullerene-C<sub>60</sub>-Ih-3',3',3'',3''-  
tetracarboxylic acid, tetraethyl ester (9CI) (CA INDEX NAME)

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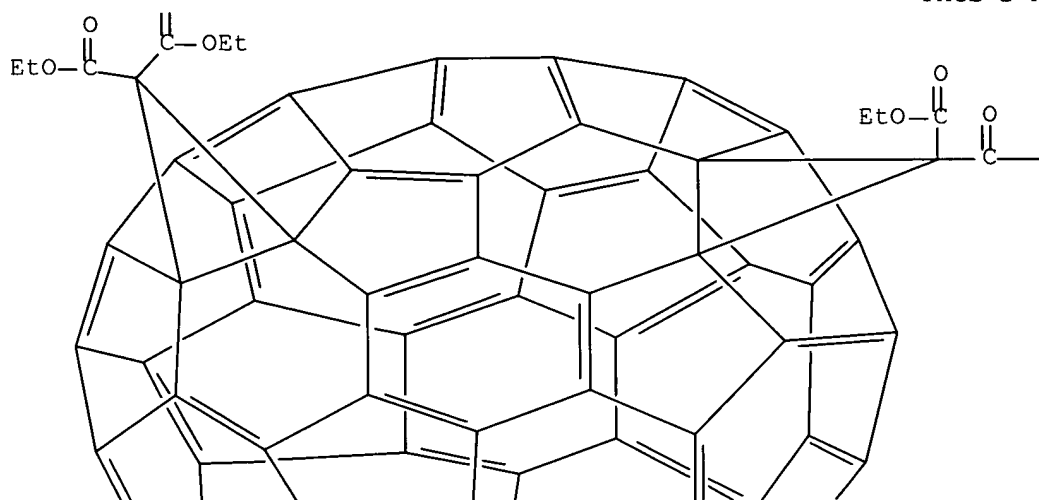
PAGE 2-A



RN 155420-08-9 HCAPLUS  
 CN 3'H,3''H,3'''H-Tricyclopropa[1,9:16,17:21,40][5,6]fullerene-C60-Ih-  
 3',3',3'',3'',3''',3'''-hexacarboxylic acid, hexaethyl ester (9CI) (CA  
 INDEX NAME)

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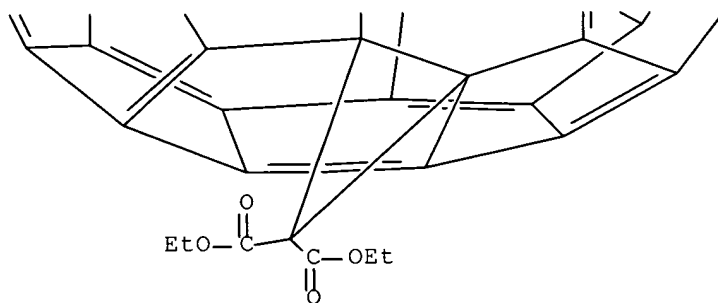
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—OEt

PAGE 3-A



=&gt; d his nofil

(FILE 'HOME' ENTERED AT 14:11:46 ON 24 OCT 2008)

FILE 'REGISTRY' ENTERED AT 14:11:51 ON 24 OCT 2008

L1 STR  
 L2 15 SEA SSS SAM L1  
 L\*\*\* DEL STR L1  
 L3 STR L1  
 L4 4 SEA SSS SAM L1 AND L3  
 D SCA  
 L5 STR L3  
 L6 4 SEA SSS SAM L5 AND L1  
 L7 179 SEA SSS FUL L5 AND L1

FILE 'CAPLUS' ENTERED AT 14:16:47 ON 24 OCT 2008

L8 129 SEA ABB=ON PLU=ON L7  
 L9 2 SEA ABB=ON PLU=ON US200!-589382/APPS  
 D SCA TI  
 SEL RN L9

FILE 'REGISTRY' ENTERED AT 14:17:47 ON 24 OCT 2008

L10 12 SEA ABB=ON PLU=ON (109-92-2/BI OR 1116-76-3/BI OR 144317-44-2  
 /BI OR 357164-86-4/BI OR 66003-78-9/BI OR 722495-59-2/BI OR  
 72317-19-2/BI OR 862714-07-6/BI OR 862714-08-7/BI OR 862714-09-  
 8/BI OR 862714-10-1/BI OR 862714-11-2/BI)  
 D SCA  
 L11 0 SEA ABB=ON PLU=ON L10 AND L7  
 E FULLERENE/CN  
 L12 2 SEA ABB=ON PLU=ON FULLERENE/CN  
 D SCA  
 D  
 D 2

FILE 'REGISTRY' ENTERED AT 14:20:26 ON 24 OCT 2008

L13 STR 99685-96-8  
 L14 50 SEA FAM SAM L13  
 L15 STR  
 L16 0 SEA SSS SAM L15 AND L13  
 L17 5 SEA SSS FUL L15 AND L13  
 D SCA  
 L18 5 SEA ABB=ON PLU=ON L10 AND L17  
 L19 7 SEA ABB=ON PLU=ON L10 NOT L17  
 D SCA

FILE 'CAPLUS' ENTERED AT 14:22:41 ON 24 OCT 2008

L20 1 SEA ABB=ON PLU=ON L17  
 L21 130 SEA ABB=ON PLU=ON L20 OR L8

FILE 'REGISTRY' ENTERED AT 14:23:14 ON 24 OCT 2008

FILE 'CAPLUS' ENTERED AT 14:23:17 ON 24 OCT 2008

D SCA L9  
 E PHOTORESISTS+ALL/CT

FILE 'HCAPLUS' ENTERED AT 14:24:02 ON 24 OCT 2008

L22 48167 SEA ABB=ON PLU=ON PHOTORESISTS+PFT,NT/CT  
 L23 68681 SEA ABB=ON PLU=ON L22 OR ?PHOTORESIST?  
 L24 1 SEA ABB=ON PLU=ON L9 AND L23  
 SEL RN

FILE 'REGISTRY' ENTERED AT 14:24:28 ON 24 OCT 2008

L25 12 SEA ABB=ON PLU=ON (109-92-2/BI OR 1116-76-3/BI OR 144317-44-2  
 /BI OR 357164-86-4/BI OR 66003-78-9/BI OR 722495-59-2/BI OR

10/589,382

October 24, 2008

72317-19-2/BI OR 862714-07-6/BI OR 862714-08-7/BI OR 862714-09-  
8/BI OR 862714-10-1/BI OR 862714-11-2/BI)

FILE 'HCAPLUS' ENTERED AT 14:26:00 ON 24 OCT 2008

L26 1 SEA ABB=ON PLU=ON L21 AND L23  
L27 130 SEA ABB=ON PLU=ON L20 OR L8

FILE 'REGISTRY' ENTERED AT 14:26:45 ON 24 OCT 2008

L28 7 SEA ABB=ON PLU=ON L25 NOT (L7 OR L17)

FILE 'HCAPLUS' ENTERED AT 14:27:05 ON 24 OCT 2008

L29 1 SEA ABB=ON PLU=ON L27 AND L28

FILE 'CAPLUS' ENTERED AT 14:28:30 ON 24 OCT 2008

FILE 'HCAPLUS' ENTERED AT 14:28:45 ON 24 OCT 2008

L30 9 SEA ABB=ON PLU=ON ?MALONIC?(3A)?ESTER? AND L27  
L31 9 SEA ABB=ON PLU=ON L26 OR L29 OR L30  
L32 1 SEA ABB=ON PLU=ON L27 AND ?RESIST?  
L33 9 SEA ABB=ON PLU=ON L31 OR L32  
L34 8 SEA ABB=ON PLU=ON L27 AND (?RESIN? OR ?FILM?)  
L35 17 SEA ABB=ON PLU=ON L33 OR L34  
L36 12 SEA ABB=ON PLU=ON L27 AND P/DT  
L37 17 SEA ABB=ON PLU=ON L35 OR L35  
L38 26 SEA ABB=ON PLU=ON L35 OR L36  
L39 19 SEA ABB=ON PLU=ON L33 OR L36  
L40 118 SEA ABB=ON PLU=ON L27 NOT L36  
L41 105 SEA ABB=ON PLU=ON L40 AND PY<2005  
L42 6 SEA ABB=ON PLU=ON L41 AND (?RESIST? OR ?RESIN? OR ?FILM?)  
L43 25 SEA ABB=ON PLU=ON L39 OR L42

FILE 'HCAPLUS' ENTERED AT 14:52:34 ON 24 OCT 2008

D QUE L43

D L43 IBIB ABS HITIND HITSTR TOT